Wet Weather Team Project Meeting Materials

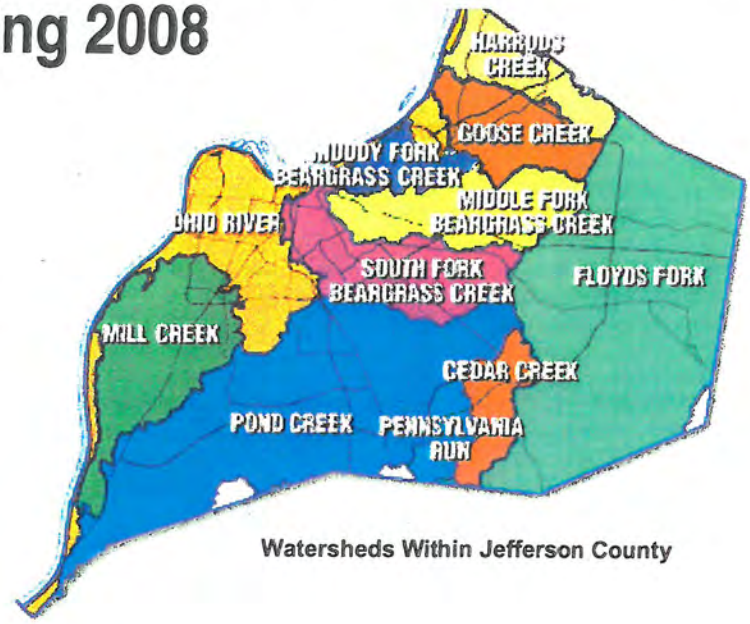
Summer 2007–Spring 2008

01.05.0213.07

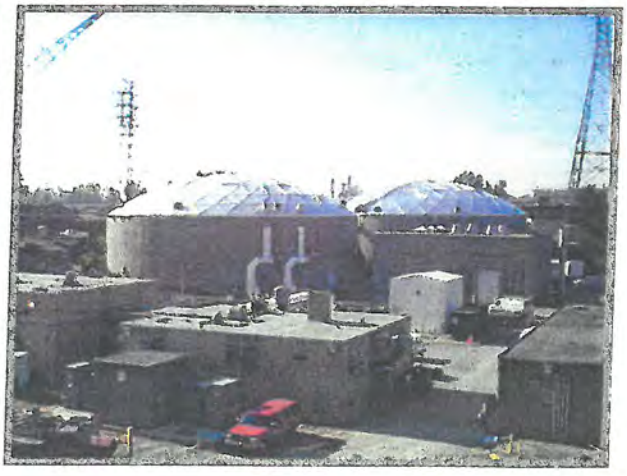
WWT Stakeholders Meeting # 13 10/13/2007

MSD

Louisville and Jefferson County
Metropolitan Sewer District



Watersheds Within Jefferson County



Agenda

Draft Agenda
Louisville and Jefferson County Metropolitan Sewer District (MSD)
Wet Weather Team Meeting #13

Thursday, October 18, 2007, 4:20-8:30PM
MSD Main Office, Board Room
700 West Liberty St., Louisville

Meeting Objectives:

- Review and discuss the role of infiltration and inflow (I&I) reduction efforts in MSD's long-term strategy for control of sanitary sewer overflows (SSOs).
- Review Consent Decree requirements related to the funding plan for the Wet Weather Program and discuss key needs and interests related to potential funding sources.
- As time allows, review and discuss a draft outline of the Wet Weather Plan.
- Identify next steps and expectations for the next meeting of the Wet Weather Team.

4:20 PM **Participants Arrive and Get Settled**

4:30 PM **Introductions, Review Agenda and Ground Rules (10 minutes)**

- Review meeting objectives.
- Review updated ground rules.

4:40 PM **Wet Weather Project Updates and Observations (25 minutes)**

- Updates on issues related to the Wet Weather Team Project and follow-up items from the last Wet Weather Team meeting.
    - Update on the fall 2007 Project WIN public meetings.
- WWT stakeholder updates and announcements.

5:05 PM **Discussion on Infiltration & Inflow Reduction in SSO Control Strategy (70 minutes)**

- Review the root causes of sanitary sewer overflows and the experiences of MSD and other entities with infiltration and inflow reduction efforts to control SSOs.
- Discuss the role of I&I reduction efforts in MSD's SSO control strategy and potential approaches to address private-side sources of I&I.

6:15 PM **Opportunity for Observer Comments (10 minutes)**

6:25 PM **Dinner Break (25 minutes)**

Dinner will be provided for Wet Weather Team members.

6:50 PM **Wet Weather Program Funding Plan Components & Funding Sources Discussion (60 minutes)**

- Review and discuss Consent Decree requirements related to the funding plan for the Wet Weather Program and key areas of Wet Weather Team input.
- Review updated information about MSD's financial condition and current funding sources.
- Discuss key community needs and interests related to potential funding sources for the Wet Weather Program.

7:50 PM **Review Draft Outline for the Wet Weather Plan (25 minutes)** ***(as time allows)***

- Review and discuss a draft outline of the Wet Weather Plan.

8:15 PM **Opportunity for Observer Comments (10 minutes)**

8:25 PM **Wrap Up and Next Steps (5 minutes)**

- Review plans and expectations for the December 6, 2007 Wet Weather Team meeting.

8:30 PM **Adjourn**

Final Meeting Summary
Wet Weather Team Meeting #13
Thursday, October 18, 2007
MSD Main Office, Louisville

The Wet Weather Team (WWT), chartered by the Louisville and Jefferson County Metropolitan Sewer District (MSD), met on October 18, 2007, at MSD's main office in Louisville. The objectives of the meeting were to:

- Review and discuss the role of infiltration and inflow (I&I) reduction efforts in MSD's long-term strategy for control of sanitary sewer overflows (SSOs).
- Review consent decree requirements related to the funding plan for the Wet Weather Program and discuss key needs and interests related to potential funding sources.

Wet Weather Project Updates and Announcements

Wet Weather Team Ground Rules, Consensus Items, and Idea Lists

At the start of the meeting, Jennifer Tice of Ross & Associates reviewed an updated version of the Wet Weather Team ground rules. The facilitation team had changed one of the ground rules to reflect the group's established practice related to observer comments at WWT meetings and to allow for multiple opportunities for observer comments at meetings, as was discussed at the September WWT meeting. The revised ground rule (#A-4) now reads:

> Observers are welcome at meetings, but are not participants in the Wet Weather Team's deliberations. A portion or portions of each meeting (not to exceed 15 minutes each) will be dedicated to receiving observer comments. Each observer's oral comments must not exceed two minutes, although written comments to the WWT and/or MSD will be welcome throughout the process.

WWT members approved of this change to the ground rules.

Rob Greenwood of Ross & Associates introduced a new tracking document related to the Wet Weather Team stakeholder process—a list of items that the WWT stakeholder group has reached consensus on. As with the other idea lists, the facilitation team will update this document throughout the remainder of the WWT process so that it remains current. Jennifer Tice also reviewed the remaining handouts for the meeting and made note of the changes and additions to the solutions ideas list, the education and outreach ideas list, and the data request and monitoring suggestions tracking list. Most of the additions to the idea lists came from the September WWT meeting and e-mail messages the facilitation team received from WWT stakeholders regarding suggestions for the fall public meetings.

During this session, Rob Greenwood also indicated that he had received feedback after the previous WWT meeting indicating concern about his handling of one part of the discussion. The concern related to an impression that he may not have acted as a fully neutral party. Mr. Greenwood apologized to the group, explained the circumstances that raised the concern, and indicated his intent during the discussion was to ask a rhetorical question but not close off discussion. Mr. Greenwood reiterated the need for the facilitation team to be strictly neutral and requested that participants provide immediate feedback if they perceive otherwise.

Other Wet Weather Project Updates and Announcements

Other announcements and observations related to the Wet Weather Project included the following.

- WEFTEC Conference: Brian Bingham of MSD noted that there was a case study presentation about the WWT stakeholder process at the annual Water Environment Federation Technical Exhibition and Conference in October 2007.
- Interim Sanitary Sewer Discharge Plan (ISSDP): Mr. Bingham said that MSD submitted the Interim Sanitary Sewer Discharge Plan to the U.S. EPA on September 28, 2007. This plan covers solutions to the "Big 4" SSOs, which MSD and the technical team have presented on at previous WWT meetings. The implementation schedule for the ISSDP is based on deadlines in MSD's wet weather consent decree; two of the Big 4 SSOs will be eliminated by 2011, and the others will be eliminated by 2013.
- Project WIN Staff: MSD has created a new staff team for Project WIN (Waterway Improvements Now). Angela Akridge of MSD is now the Project WIN Program Manager. There are three managers reporting to Ms. Akridge who will oversee different aspects of Project WIN, as follows.
    - Gary Swanson of CH2M HILL will oversee the development of MSD's integrated Wet Weather Plan. The main engineering firms involved in the development of the plan include CH2M HILL, Tetra Tech, O'Brien & Gere, and Strand Associates.
    - Vicki Coombs of MSD oversees the capital program and the implementation of projects.
    - Julia Muller of MSD manages MSD's data systems.
- Public Outreach and Education: Angela Akridge said that MSD has scheduled all of the Project WIN public meetings ("listening sessions") planned for October and November 2007, and continues to prepare for the holiday season public outreach campaign. MSD distributed several public outreach materials to participants at the meeting, including a public notification flyer that will be distributed to residents within the combined sewer area, a draft of the holiday season Project WIN postcard, and a draft flyer for the fall public meetings. MSD is interested in getting feedback on these materials.
- Sewer Overflow Response Protocol (SORP): Ms. Akridge noted that MSD is conducting training for staff about MSD's SORP program, which includes how MSD responds to and documents overflows when they occur. MSD plans to present a 15-minute overview of the SORP training to the MSD Board and to the WWT stakeholder group at a future WWT meeting.

Role of Infiltration and Inflow in MSD's Sanitary Sewer Overflow Control Strategy

Gary Swanson of CH2M HILL gave a presentation on the role of infiltration and inflow (I&I) in MSD's SSO control strategy. His presentation covered the root causes of SSOs, MSD's experiences with I&I reduction efforts addressing public and private facilities, case studies of other agencies that have used I&I reduction as part of a strategy to address SSOs, critical success factors to achieve regulatory approval of an SSO elimination program, and issues to consider when developing an approach to controlling private sources of I&I into the sanitary sewer system. Key points from this presentation included the following.

- Infiltration and inflow contributes to two-thirds of MSD's sewer main SSOs.
- Private property sources typically contribute 50 percent or more of all I&I in the system.
- The experience of wastewater utilities across the country shows that I&I reduction is an important component of effective control of SSOs. This experience also shows that source-control approaches alone are not likely to be effective at eliminating all SSOs over the long term.

- Successful efforts to reduce I&I into sanitary sewer systems have addressed sources of I&I on private properties (including building laterals, sump pumps, downspouts, drains, etc.) as well as sources of I&I from publicly maintained parts of the sewer system (including sewer main lines, manholes, etc.).
- MSD's overall SSO control strategy will reflect a balance of solutions, including source control (I&I reduction), storage, conveyance, and treatment.
- MSD's current approach to reducing private sources of I&I is the voluntary Plumbing Modification Program.
- Any additional private-side I&I reduction approaches must consider three issues: (1) legal authority to enter properties; (2) who pays for property improvements; and (3) public education and involvement.

WWT members asked several clarifying questions related to this presentation. Additional information provided by MSD and the technical team in response to questions included the following.

- If the trigger for an inspection of a property were property transfer, it would take about seven years to address I&I sources at all property, based on the average turnover rate for properties nationwide.
- The largest sources of I&I are from residences, rather than from commercial or government buildings.
- SSOs occur everywhere; the worst ones tend to be in areas with high ground water or areas that are downstream from high-groundwater areas.
- In the ISSDP, the solution to eliminate SSOs in the Beechwood Village includes addressing private sources of I&I (e.g., the laterals connecting to homes).

The Wet Weather Team's discussion focused on two main topics: (1) WWT stakeholders' comfort with the overall high-level strategy for control of SSOs and the role of I&I reduction in that strategy; and (2) WWT perspectives on the need to examine new, involuntary approaches to reduce private-side I&I and the characteristics that such an approach should have. Comments and observations from WWT members included the following.

Suggestions for an Overall SSO Control Strategy

- Education will be an essential component of the strategy. It is important to make people aware of the problem and help them understand that they are part of the problem (take ownership of it).
    - For a voluntary program to be effective, people need to understand that they're part of the problem. There also isn't much incentive to take action if no one else is.
    - One challenge related to education is that people may think that paying the EPA consent decree rate surcharge makes the problem MSD's to solve, rather than the community's as a whole.
    - Several WWT participants noted that there needs to be community ownership of the solution.
- A few WWT members suggested that government should have a role in "leading by example" by eliminating I&I entering the sewer systems from government-owned properties.
- A few WWT members suggested that MSD (and potentially other consent-decree communities) challenge preconceived notions of what U.S. EPA will accept in terms of the role of source control in an SSO elimination plan. The technical team and MSD were encouraged to use technical feasibility and cost effectiveness as the primary basis for deciding the level of source control to meet regulatory compliance obligations.

Potential Approaches to Address Private Sources of I&I

- One alternative suggested for MSD and the technical team to consider is instituting a requirement that no clear water enter the sanitary sewer system.
- Another alternative suggested was for MSD to repair and seal all building laterals, as will be done for Beechwood Village. A WWT stakeholder questioned whether MSD had set a precedent for paying for this work using revenues from ratepayers based on the plan for Beechwood Village.

- Several WWT members indicated support for the development of an approach to address private-side I&I sources that would have an involuntary component (a "stick" or "teeth" to ensure accountability) but also some form of financial cost share. In addition to financial cost share, some WWT members suggested several potential requirements for a private-side I&I reduction initiative, as follows.
  - An aggressive education effort would need to be conducted before any new requirement would be imposed on property owners.
  - Enacting a new requirement will require generating the political will for it. The Louisville Metro Council will need to be engaged early on in the development of a new involuntary approach.
  - There would need to be a deadline for when action would be taken (e.g., cutting off water service) if the requirement were not met.

WWT stakeholders agreed that the facilitation team will draft a document based on this meeting's discussions that summarizes the current understanding of the WWT stakeholder group on the high-level SSO control strategy and associated I&I reduction efforts the technical team will be exploring through in-depth analysis.

Wet Weather Program Funding Plan

Marion Gee, MSD Finance Director, reviewed the consent decree's requirements related to a funding plan for MSD's Wet Weather Program, information about MSD's financial condition now that an EPA consent decree surcharge has been added to MSD service bills, and the advantages and disadvantages of a range of potential funding sources available for financing the Wet Weather Program. MSD currently obtains most of its funding from two sources: revenues from service charges and municipal bonds. MSD revenues for FY 2007 were $132.5 million; the consent decree rate increase is expected to generate additional revenues of $35 million per year. MSD currently has $1.3 billion in tax exempt bonds, which require principal and interest payments of $89 million per year. MSD's capital budget for FY 2008–12 is $294.5 million; MSD's operating budget for FY 2008 is $92 million. Four key areas for WWT stakeholder input on the funding plan include:

1. Refinement of rate structure;
2. Prioritization of capital projects;
3. Development of additional user fees; and
4. Funding alternatives (including pay-as-you-go strategies using various MSD revenue streams, municipal bonds, capital contributions, federal grants, and state/county loan programs).

Due to concerns about strong wind storms and potential tornadoes in the Louisville metro area, the WWT meeting was cut short before there was an opportunity to respond to and discuss the funding presentation. Future WWT meeting discussions will cover all four of the funding plan topics listed above.

Draft Outline of the Integrated Wet Weather Plan

A draft outline of the integrated Wet Weather Plan for addressing CSOs and SSOs was distributed to participants, but not discussed at this meeting. This will be a discussion topic at the next WWT meeting.

Observer Comments

There were no comments from observers at this meeting.

Wrap Up and Next Steps

- The facilitation team will summarize the WWT stakeholder group's understanding of the high-level SSO control strategy the technical team will conduct analysis on and will distribute the draft understandings document to the WWT for review.
- MSD will host a series of public meetings on Project WIN to solicit community input on potential strategies to control CSOs and SSOs. Meeting locations, dates, and times are as follows.
    - The Nia Center - 2900 W. Broadway, October 29, 2007, 6pm - 8pm
    - Fern Creek Fire House - 6200 Bardstown Road, October 30, 2007, 6pm - 8pm
    - East Government Center - 200 Juneau Drive, November 12, 2007, 6pm - 8pm
    - Fairdale Playtorium Center -10616 Manslick Road, November 13, 2007, 6pm - 8pm
    - Sun Valley Community - 6505 Bethany Lane, November 20, 2007, 6pm - 8pm
    - Clifton Center - 2117 Payne Street, November 27, 2007, 6pm - 8pm
- The next WWT meeting will be on Thursday, December 6, 2007, at MSD's main office. Potential meeting topics include:
    - Debrief from the fall Project WIN public meetings;
    - Next steps discussion related to an approach to addressing private sources of I&I entering the sanitary sewer system;
    - Follow-up discussion on the components of the funding plan for MSD's Wet Weather Program and on potential funding sources;
    - Review and discussion of the draft outline for MSD's integrated Wet Weather Plan for long-term control of CSOs and SSOs; and
    - Overview presentation on MSD's Sewer Overflow Response Protocol.

Meeting Participants

Wet Weather Team Stakeholders

Steve Barger, Labor
Susan Barto, Mayor of Lyndon
Charles Cash, Louisville Metro Planning & Design Services Department
Allan Dittmer, University of Louisville
Faye Ellerkamp, City of Windy Hills
Arnita Gadson, University of Louisville/West Jefferson County Community Task Force
Tom Herman, Zeon Chemicals
Bob Marrett, CMB Development Company
Kurt Mason, Jefferson County Soil and Water Conservation District
Judy Nielsen, Louisville Metro Health Department
Lisa Santos, Irish Hill Neighborhood Association
Bruce Scott, Kentucky Waterways Alliance
David Tollerud, University of Louisville, School of Public Health & Information Sciences
David Wicks, Jefferson County Public Schools

MSD Personnel

Angela Akridge, MSD Regulatory Policy Manager

Brian Bingham, MSD Regulatory Management Services Director
Derek Guthrie, MSD Director of Engineering/Operations & Chief Engineer
Bud Schardein, MSD Executive Director

Facilitation and Technical Support

Rob Greenwood, Ross & Associates Environmental Consulting
Gary Swanson, CH2M HILL
Jennifer Tice, Ross & Associates Environmental Consulting

Meeting Observers

Susan Bahng, O'Brien & Gere
Phyllis Croce, MSD
Marion Gee, MSD
Clay Kelly, Strand Associates
John Lyons, Strand Associates
Tony Marcon, MSD/URS Corporation
Chad McCormick, FMSM Engineers
David Mindel, Mindel, Scott & Associates (MSA), Inc.
Teri Pifine, MSD
Wes Snydor, MSD/O'Brien & Gere
Scott Spears, Land Design & Development (LD&D), Inc.
John Wilson, Sabak, Wilson & Lingo (SWL), Inc.

Meeting Materials

- Agenda for the 10/18/07 WWT Meeting
- Summary of the 9/20/07 WWT Meeting
- Wet Weather Team Ground Rules (final version, updated October 2007)
- WWT Consensus Items List (working draft, October 2007)
- Solution Ideas List (updated October 2007)
- Education and Outreach Ideas List (updated October 2007)
- Data Requests and Monitoring Suggestions List (updated October 2007)
- Infiltration & Inflow Reduction in SSO Control Strategy Presentation
- Water Environment Federation Private Property Virtual Library Fact Sheet
- Project WIN Funding Plan Presentation
- Draft Outline of Integrated Wet Weather Plan (Draft of 10/17/07)
- MSD "Clean, Green, Growing Community" Brochure
- Project WIN Meeting Flyer (October 2007 draft)
- Project WIN Holiday Postcard (October 2007 draft)

Louisville and Jefferson County Metropolitan Sewer District
Wet Weather Team Ground Rules
Final Version, 8/15/06 (updated 10/5/07)

A. Participants and Participation

1. Wet Weather Team (WWT) members are "participants." The Wet Weather Team consists of MSD personnel and a subgroup of stakeholders that will provide guidance to MSD. MSD personnel may participate in WWT discussions, but will not be included in decisions regarding stakeholder guidance to MSD. All participants in the stakeholder subgroup have equal representation.

2. The facilitation team is a neutral third party with no stake in the outcome of the discussions. The facilitation team, although under contract to MSD, works for the process and treats all Wet Weather Team participants as equal "clients."

3. To ensure an effective process, participants agree to make every effort to attend all meetings. If an alternate is needed, the suggested alternate will be recommended to and discussed with MSD in advance to ensure there will be appropriate balance and representation on the Wet Weather Team.

4. Observers are welcome at meetings, but are not participants in the Wet Weather Team's deliberations. A portion or portions of each meeting (not to exceed 15 minutes each) will be dedicated to receiving observer comments. Each observer's oral comments must not exceed two minutes, although written comments to the WWT and/or MSD will be welcome throughout the process.

5. MSD will consider requests from participants to invite outside experts to speak at Wet Weather Team meetings on relevant topics; however, MSD reserves the option of providing additional or alternative perspectives at meetings to ensure that the full range of perspectives and factual evidence is provided.

6. Wet Weather Team members are expected to participate through the entire process; however, any participant may withdraw from the process at any time without prejudice. In the event a participant chooses to withdraw, he or she should communicate the reasons for withdrawal and may be replaced by MSD with another representative with similar expertise and experience.

B. Meeting Discussions and Procedures

1. Each participant agrees to honest and direct communications.

2. Participants are encouraged to frame observations in terms of needs and interests, not in terms of positions; opportunities for finding solutions increase dramatically when discussion focuses on needs and interests.

3. Decisions will be made during meetings; if an alternate attends a meeting, he or she must be fully briefed on Wet Weather Team deliberations and able to participate in decision making.

4. The facilitator will manage the discussions, using more or less structure depending on the nature and tenor of the discussions.

5. Participants and/or the facilitator may request a caucus break at any time during the meeting. Individual caucus breaks are not to exceed 15 minutes.

6. A general summary of meeting discussions will be prepared; observations contained in the summary will not be individually attributed. Participants can, however, submit attributed comments directly to MSD and/or the MSD Board for consideration; all written comments will be made available publicly.

7. All meetings will start and finish on time.

C. Desired Outcomes

1. The stakeholder subgroup of the Wet Weather Team is a "consensus seeking" body. The desired outcome is one in which all stakeholder subgroup members support the products and are willing to say so publicly. Full consensus, however, is not necessary to enable the MSD Board to have a balanced and well-informed final decision process.

2. The perspectives of all WWT stakeholders—particularly in cases where consensus is lacking—will be gathered throughout the plan development process and made available to the MSD Board for consideration during their final decision making.

3. To help the process stay on track, agreed-upon, non-mainstream issues may be recorded and dealt with at a later date or referred to other, more appropriate forums.

D. Communications Outside of Wet Weather Team Meetings

1. Individual observations are not for attribution outside the meeting.

2. Participants are encouraged to refer inquiries from the press to the facilitation team or to final meeting summaries or other final Wet Weather Team materials. Individuals who choose to speak with the press agree to limit remarks to personal views and to refrain from characterizing the views of, or attributing comments to, other participants or the full Wet Weather Team.

3. Wet Weather Team participants may share information about the project's process and activities with peers outside the Team, as long as the communications make clear that the information is not an official product of the Team.

4. Wet Weather Team participants may share draft documents and communicate about the project's progress with managers and co-workers within their own organizations. Wet Weather Team participants agree to consult with the Team before sharing draft documents outside of the Team or their immediate co-workers and managers.

Wet Weather Team Consensus Items
Working Draft – October 5, 2007

The following is a list of items on which the Wet Weather Team (WWT) has come to consensus, organized by the date of the WWT meeting at which consensus was reached. The facilitation team will maintain and update this list throughout the remainder of the WWT effort.

Consensus Item	Wet Weather Team Meeting	Reference Document
1. Wet Weather Team Charter	Wet Weather Team Meeting #2 (August 15, 2006)	Wet Weather Team Charter (August 15, 2006)
2. Wet Weather Team Ground Rules	Wet Weather Team Meeting #2 (August 15, 2006)	Wet Weather Team Ground Rules (August 15, 2006)
3. Wet Weather Team Community Values	Wet Weather Team Meeting #6 (February 13, 2007)	Wet Weather Team Community Values
4. Performance Evaluation Framework for Project-Specific Values	Wet Weather Team Meeting #9 (May 22, 2007)	Final Draft Performance Measurement Matrices
5. Approach for Incorporating Programmatic and Project-Specific Values into Decision Making	Wet Weather Team Meeting #9 (May 22, 2007)	Values-Based Decision-Making Flowchart
6. Weights for Project-Specific Values	Wet Weather Team Meeting #10 (June 21, 2007)	See: Summary of the June 21, 2007 Wet Weather Team Meeting

Wet Weather Team Solution Ideas
Working Draft – October 12, 2007

The following is a list of potential "solution ideas" identified by Wet Weather Team (WWT) members that will be considered in the design of the Wet Weather Program. The list will act as a resource for the technical team as they consider project and program alternatives. These ideas were identified both at WWT meetings and through individual communications with WWT members (e.g., via e-mail). This list will remain "live" throughout the remainder of the WWT effort to capture ideas as they are shared. WWT members are encouraged to send additional ideas to the facilitation team for inclusion in this list.

New ideas will be listed under a "What's New" section at the beginning of the document for easy reference, as well as under the appropriate section later in the document. After the "What's New" list, this document is organized into three sections:

- Section I, "Project Alternatives," is organized into five sub-categories: Stormwater Best Management Practices (Non-Structural), Stormwater Best Management Practices (Structural), CSO and SSO Point Source Controls, General/Other Solutions, and Site-Specific Solutions.
- Section II, "Funding Ideas and Incentives," is organized into three sub-categories: Cost Allocation Strategies, Financial Incentives, and Funding Sources/Options.
- Section III, "Ideas Partly or Completely Outside the Scope of MSD's Wet Weather Consent Decree," includes municipal government actions that are only partly within MSD's control, MSD actions that are not related to sewer overflow issues, and green infrastructure ideas that are not directly related to sewer overflow issues.

What's New (September/October 2007)

1. (I-C-2-a) – Incorporate inspections into the property-transfer process (e.g., as another inspection with the sale of existing homes). For example, MSD could deputize the state plumbing inspector, which has the authority to go into private property, to conduct inspections of downspouts. MSD could pay on a per building basis for those inspections.
2. (I-C-3) – Look at large parking lots as potential sites for wastewater storage facilities. Organizations might be willing to have a covered storage facility built below a ground-level parking lot. In addition, there could be opportunities to add value for the property owner, by building a parking garage as a replacement and/or by providing credit for any non-point source pollution reduction associated with the project.
3. (I-D-5) – Do not rule out flow-reduction techniques to address SSOs for any watershed.
4. (I-D-6) – Look at combining different types of control options, including opportunities to reduce flows of water into the sewer system (e.g., from housing units) in tandem with other types of solutions. For example, combining storage and flow-reduction approaches could make it possible to use a smaller-sized storage facility.
5. (I-D-7) – Involve community members in addressing the root causes of SSOs (e.g., by working with the Metro Council, community organizers, and neighborhood groups).
6. (I-E-BGC Middle Fork-5) – Consider locations/sites for storage solutions that are closer to the SSOs in the Anchor Estates Pump Station watershed than the potential location presented at the 9/20/07 WWT meeting.
7. (I-E-BGC Middle Fork-6) – Utilize parks property orphaned by I-64 as a detention basin for the Beals Branch sewershed CSO. Restore the sediment-filled wetland at the confluence of Beals Branch and the Middle Fork as a treatment wetland for the basin's discharge.

8. (III-A-Regulatory Requirements-6) – Develop an ordinance that would allow MSD or a plumbing inspector to enter homes to identify sources of infiltration and inflow (e.g., broken foundation drains). MSD could subsidize or help pay for the costs of the inspections.
9. (III-A-Other Entities-4) – Consider linking Wet Weather Program construction projects to road construction efforts.
    a. One potential place for such a linkage is the road construction occurring in the Goose Creek Pump Station area.

I. Project Alternatives

A. Stormwater Best Management Practices (Non-Structural)

1. Influence behavior of residential and commercial landowners through education.
    a. Promote water conservation practices: rain gardens, rain barrels, and responsible alternatives for sump pumps and downspout connections.
    b. Encourage stewardship: removing invasive vegetation from riparian zones, planting wetlands, litter cleanups, etc.
    c. Conduct education on environmentally sustainable ways of using fertilizer and weed killer, and other stormwater best management practices to neighborhood groups.
    d. Discourage chemical treatment of and mowing near waterways to help keep debris from waterways.
2. Regularly distribute billing inserts (like LG&E's) to MSD customers with facts and tips to encourage certain behaviors (e.g., lawn chemical management, pet waste management, landscaping practices).
3. Conduct a baseline survey and follow-up surveys of residents to determine whether education and outreach efforts are effective in changing behavior and perceptions on issues related to the Wet Weather Program.
4. Hold "CSO Action Days" during or right after a hard rain to promote behavior change (e.g., don't use your dishwasher, wait to do your laundry, etc.).
5. Develop a pledge for customers that clearly lays out behaviors that will help MSD meet Consent Decree requirements. For an example, see http://www.watershedpledge.org (see also II-B-4).
6. Encourage the use of best management practices for chemical use in lawn management practices.
    a. Inform greens keepers about best management practices (BMPs), since non-point source runoff is made worse by golf course chemicals.

B. Stormwater Best Management Practices (Structural, including Green Infrastructure Solutions)

1. Use landscaped areas to control stormwater runoff.
2. Encourage homeowners to construct rain gardens and use rain barrels.
3. Install French drains along roads to accept stormwater runoff (see also detailed suggestions listed for Beechwood Village below).
4. Develop specific design parameters or standards for stormwater best management practices and low impact development techniques and include these in an MSD Design Manual. The Design Manual should provide guidance for approaches including, but not limited to, the following:
    a. Pervious pavement
    b. Level spreaders
    c. Riparian buffers
    d. Vegetated swales

e. Wet ponds
f. Wet ponds with forebays (small basins that settle out incoming sediment before it is delivered to a stormwater BMP)
g. Wetlands

5. Consider incorporating aspects of the LEED green building standards into MSD design manuals for structural BMPs.
6. Increase tree canopy.
    a. Ensure that urban CSO areas have at least a 30 percent tree canopy.
    b. Initiate a tree-planting program with a goal to increase tree canopy in neighborhoods.
7. Work with the community group "Women of Vision" to create a meditation garden in the West End that could also act as a rain garden or roof runoff demonstration.
8. Conduct demonstration projects. [Note: Overlaps with demonstration projects in Education and Outreach Ideas List.] Specific ideas for projects include:
    a. Create a demonstration area in each Jefferson County watershed to demonstrate and interpret healthy stream habitats and what MSD is doing to study and protect them.
    b. Create some sustainable lawns as pilot projects
    c. Develop a green infrastructure best management practice site similar to SD1 (Sanitation District Number 1 of Northern Kentucky).
    d. Add green demonstration/education facilities to old urban schools.
    e. Use the Butchertown Greenway Pump Station that is offline for an education and demonstration facility.
9. Plant native plants with deep root systems.
10. Maintain existing detention/retention basins – many may not function properly due to lack of maintenance.
11. Design structural stormwater best management practices to be multiple-use and eco-friendly.
    a. Design detention ponds and stream buffers for recreational use.
    b. Make use of detention facilities as sports fields
    c. Incorporate trails along streams to provide recreational opportunities.

C. CSO and SSO Point Source Controls

1. Disconnect downspouts and/or sump pumps (e.g., by developing educational initiatives aimed at landowners).
    a. One potential target for a downspout disconnection program could be school buildings.
    b. Yard signs similar to those used in Portland's residential Downspout Disconnection Program could be useful for education and outreach about MSD's Wet Weather Program. [Note: This idea overlaps with the Education Ideas List.] Specific ideas for signs include:
        i. Messages such as "I disconnected my downspout" and/or "I have a rain barrel."
        ii. The bottom of the sign could invite readers to "ask me" for more information.
2. Increase enforcement and inspections of downspout and sump pump connections.
    a. Incorporate inspections into the property-transfer process (e.g., as another inspection with the sale of existing homes). For example, MSD could deputize the state plumbing inspector, which has the authority to go into private property, to conduct inspections of downspouts. MSD could pay on a per building basis for those inspections.
3. Look at large parking lots as potential sites for wastewater storage facilities. Organizations might be willing to have a covered storage facility built below a ground-level parking lot. In addition, there

could be opportunities to add value for the property owner, by building a parking garage as a replacement and/or by providing credit for any non-point source pollution reduction associated with the project.

D. General/Other Solutions

1. Leverage and coordinate the Wet Weather Program efforts with MSD's MS4 stormwater management permitting responsibilities.
2. Conduct green infrastructure demonstration projects with monitoring components built in, to help demonstrate the overall effectiveness of green infrastructure solutions.
    a. Start with small, visible projects ("quick wins" – e.g., in a particular neighborhood, near a Rubbertown plant).
3. Preserve rural character where possible.
4. Create a localized resource database to support green infrastructure development efforts (e.g., provide information on contractors that install pervious pavements). Specific ideas include:
    a. Develop a list of environmentally approved chemicals for use in lawn/landscape management.
    b. Landscape architects could provide green options for projects and developments.
5. Do not rule out flow-reduction techniques to address SSOs for any watershed.
6. Look at combining different types of control options, including opportunities to reduce flows of water into the sewer system (e.g., from housing units) in tandem with other types of solutions. For example, combining storage and flow-reduction approaches could make it possible to use a smaller-sized storage facility.
7. Involve community members in addressing the root causes of SSOs (e.g., by working with the Metro Council, community organizers, and neighborhood groups).

E. Site-Specific Solutions (Considered in Addition to the Solutions Listed Above)

Beechwood Village

1. Construct a park-like wet detention area in the wooded area of St. Matthews Park.
2. Install new sanitary lines and laterals to homes, and pumps for basement facilities when requested by the homeowner.
3. Install French drains on either side of roadways to accept stormwater runoff. The drains would be continuous trenches filled with gravel and covered by turf. The drains could also accept discharges from sump pumps and downspouts.
4. Install perforated pipe in the French drains so they can discharge more freely when they flood. The piped drain system would need to be a combination of gravity and pump depending on the topography and discharge point(s).
5. If a solid pipe system is used, the system could discharge to constructed wetlands designed to treat stormwater. Possible sites for constructed wetlands are the forest north of the Community Park and the detention pond for the bank on Shelbyville Road at the Beechwood Village entrance.
6. Restore natural stream banks for the Sinking Fork north of Shelbyville Road where the big pump now sits.

Beargrass Creek – Middle Fork

1. Restore the Middle Fork between Grinstead crossing and confluence.
    a. Restore wetlands and improve aquatic health in the following areas:

i. The isolated quarry areas to the north of the interstate between Grinstead and Payne (which receives a small CSO discharge). One specific idea is to remove sediments from these areas.

ii. The old meander into which CSO 127 discharges and the wet meadow in its bend.

b. Work with the City of Louisville, the Parks, and the private sector to turn this area into a greenway that connects the waterfront with Cherokee and Seneca Parks, and eventually with parks in Saint Matthews, with a bikeway from Saint Matthews to downtown.

c. Close CSOs in this area using projects that reduce flooding and improve water quality.

2. CSOs 125, 126, 127, 144, and 166; and CSOs 86 and 140 could potentially be treated at one facility (some pumping would be required). This could be a visible project that could help link areas in the community.
3. Potentially develop the River Metals property (a brownfield near the Girl Scouts Building) as a storage or wetlands treatment area.
4. Establish wetlands at Seneca Park and Old Cannons Lane.
5. Consider locations/sites for storage solutions that are closer to the SSOs in the Anchor Estates Pump Station watershed than the potential location presented at the 9/20/07 WWT meeting.
6. Utilize parks property orphaned by I-64 as a detention basin for the Beals Branch sewershed CSO. Restore the sediment-filled wetland at the confluence of Beals Branch and the Middle Fork as a treatment wetland for the basin's discharge.

Beargrass Creek – South Fork

1. Restore the South Fork between I-264 and Eastern Parkway.
   a. Restore the stream channel, along with the wet meadows and woods in the floodplain.
   b. Coordinate with landowners (e.g., the City of Louisville and Bellarmine College) on the restoration of the stream segment, which is part of a "nature education" corridor and is subject to MSD conservation easements.
   c. Potentially make this area into a bikeway as part of the solution.

Beargrass Creek – Muddy Fork

1. Restore Eva Bandman Park.
   a. Convert the park into restored wetlands with a boardwalk for visitors.
   b. Include the park as part of the solution for the CSOs that discharge at the confluence by having it receive their stormwater.
2. Tie the impaired section of Beargrass Creek to newly created wetlands, near Eva Bandman Park.
3. Incorporate green infrastructure into the Arts Center.
4. Turn the MSD pump station into an interpretive center.
5. For CSOs 132, 154, and 167:
   a. Conduct a concentrated effort to disconnect downspouts in this area.
   b. Use incentives to get people to help solve the problem in this area. In particular, educate people about ways to reduce non-point source pollution.
   c. Acquire properties in flood-prone areas by paying more than fair market value for the homes (as compensation to homeowners for having to move). These areas could then be used to create detention or retention basins, or other facilities/structures to reduce wet-weather sewer overflows. [Note: Purchasing properties in flood-prone areas is also listed in Section III.]

Floyds Fork Watershed

1. Look for opportunities for green infrastructure in the Floyds Fork watershed, as it is the last undeveloped area in Jefferson County.
2. Protect Floyds Fork with riparian buffers and other preservation efforts.

Other Watershed and Site-Specific Solutions

1. Create an 800-acre lake in the southwest portion of Jefferson County. Use a dam/flood wall to build it and include marshes around it.
2. Examine other sites for green infrastructure opportunities, such as:
    a. Pond Creek Lake and the southwest pump stations (this area has been studied already by the Corp of Engineers)
    b. The Bradley Property

II. Funding Ideas and Incentives

A. Cost Allocation Strategies

1. Equitably assign costs (focus areas for the financial equity value):
    a. Consider the burden on fixed income and low-income populations
    b. Rates and fees that are linked to the cost to serve (i.e., the level of impact)
2. Charge residences differently depending on the area of impervious surfaces on properties (and therefore the amount of stormwater runoff that would be generated).
3. Require lower development fees for areas that already have sewer capacity (e.g., urban areas in need of re-investment).
4. Bill based on increased water usage—the more you use, the higher the rate.
5. Develop an equitable plan for joint funding for permeable pavement efforts.

B. Funding Sources/Options

1. Consider using volunteers to reduce costs.
2. Consider solutions that could meet the objectives of multiple agencies (e.g., water quality and flood control improvements) and therefore could potentially receive funding from multiple sources.

C. Incentives

1. Provide incentives for "preferred" behaviors.
2. Offer incentives for developers to use cost-effective, eco-friendly solutions (e.g., low impact development techniques, stormwater best management practices).
3. Charge reduced wastewater rates to property owners that use eco-friendly techniques to reduce stormwater runoff.
4. Reduce fees for families or businesses who sign a pledge that clearly lays out behaviors that will help MSD meet Consent Decree requirements (see also I-A-5).
    a. In critical CSO neighborhoods, provide free rain barrels to people who sign the pledge.
5. Develop compensation credits to help alleviate financial burden to developers and property owners.

III. Ideas Partly or Completely Outside the Scope of MSD's Wet Weather Consent Decree

A. *Municipal Government Actions (Only Partly within MSD's Control)*

Regulatory Requirements/Policies

1. Improve the development review process for new subdivisions. Deny permits for subdivisions or any new homes if the plant in the area is above capacity.
2. Require that regional detention ponds in post-developed areas provide filtration for storms that occur every two years or less.
3. Require post-development runoff to be equal to pre-development runoff.
4. Develop mandatory or alternative green solutions for development projects (e.g., by changing development codes).
5. Determine impervious surface limits for individual watersheds.
6. Develop an ordinance that would allow MSD or a plumbing inspector to enter homes to identify sources of infiltration and inflow (e.g., broken foundation drains). MSD could subsidize or help pay for the costs of the inspections.

Opportunities to Encourage/Use Green Infrastructure in Development Projects

1. Utilize very large basins or lakes in new development areas and in rural areas. For new developments, create larger detention/retention basins.
2. Preserve existing natural systems, vegetation, and trees during development, rather than removing and rebuilding them. Take advantage of existing assets in development opportunities.
3. Look at green parking opportunities along business corridors.
4. Look at opportunities to develop more upward and infill already developed areas (i.e., increase density).
5. Develop a "complete streets" program policy to encourage "parkway-like" streets and reduce stormwater run-off.
6. Form partnerships with housing developers to minimize impervious surfaces.
7. The parking lot on Frankfort Avenue could utilize porous pavement for public parking.
8. Develop a recognition program for those who use green infrastructure.
9. Opportunities in schools:
    a. Incorporate green elements into the three new research facilities being planned at the University of Louisville.
    b. Turn school grounds into "ecological playgrounds" for neighborhoods.

Opportunities to Link MSD Efforts to Existing Partnerships and Programs

1. Develop a "comprehensive solution" for local environmental improvement and education efforts.
    a. Fund and staff a collaborative planning effort to link the environmental education programs of multiple local agencies (MSD, Louisville Water Company, Metro government departments, Mayor's Office, TARC, etc.) together, develop specific goals and assessment systems, and then hold agencies accountable to those goals.'
2. Encourage local government agencies (e.g., Jefferson County Public Schools, Metro Parks) to adopt preventative practices to decrease stormwater runoff and wastewater volumes (e.g., low-flow toilets, pervious pavement, additional tree coverage, etc.).
3. Integrate green projects into planning efforts underway.

4. Work with the Green City Partnership (an initiative involving the Louisville Metro Government, Jefferson County Public Schools, and the University of Louisville) on green infrastructure efforts. The Metro Green Initiative should be a leader for the community's Green City Partnership.
5. Consider green infrastructure in the context of healthy activity improvement projects and projects that promote greater walk-ability in neighborhoods.
6. Make use of neighborhood plans. There could be opportunities to incorporate green infrastructure into the 14 neighborhood plans and 6 neighborhood assessments that are being developed, as well as in neighborhood plans that well be developed in the future.

Opportunities for MSD to Collaborate with Other Entities

1. Coordinate with planning and zoning departments and other governmental entities around the value of green infrastructure.
2. Partner with schools to relate students' community service efforts with green projects.
3. Coordinate with other regional entities to build a major treatment plant near the Salt River.
4. Consider linking Wet Weather Program construction projects to road construction efforts.
    a. One potential place for such a linkage is the road construction occurring in the Goose Creek Pump Station area.

B. *MSD Actions Not Related to Sewer Overflow Issues*

1. Purchase properties within the floodplain.
    a. Buy land that is flooded on a regular basis and turn it into parks.
    b. When building a detention basin, buy properties in the floodplain that are most impacted.
2. Improve implementation and enforcement of the Sediment Control Act.
3. Partner with local lawn care companies to promote Louisville Green (MSD's organic fertilizer)

C. Green Infrastructure Ideas Not Related to Wet Weather Issues

1. Heine Brothers Coffee is looking for five acres for an urban farm to grow produce and sell to local restaurants.
2. The "86-64" community effort to remove portions of I-64 could be an opportunity to reclaim the waterfront and promote public transportation such as light rail.
3. Utilitize the open space in parks for green infrastructure.
4. Develop and educate residents about urban farming opportunities.
5. Teach and promote sensible/responsible development.
6. Require parking lots to provide shaded areas.
7. Establish a tree ordinance to protect specific trees (identified based on species, age, etc.) and require mitigation if the protect trees are damaged or removed.
8. Protect or improve water quality and flood control for developments.

Wet Weather Team Education and Outreach Idea List
Working Draft – October 12, 2007

The following is a list of education and outreach ideas identified by Wet Weather Team (WWT) members for consideration for the Wet Weather Program. The list will act as a resource for MSD and the technical team as they develop and refine the draft education and outreach plan for MSD's Wet Weather Program. (The focus of this list is on long-term education, outreach, and public engagement efforts, rather than near-term activities such as public meetings occurring during the WWT process.) These ideas were identified both at WWT meetings and through individual communications with WWT members (e.g., via e-mail). This list will remain "live" throughout the remainder of the WWT effort, and WWT members are encouraged to send additional ideas for this list to the facilitation team.

New ideas will be listed under a "What's New" section at the beginning of the document for easy reference, as well as under the appropriate section later in the document. The remainder of the document is organized into two main sections, Section I, which focuses on MSD Wet Weather Program education and outreach efforts, and Section 2, which covers efforts that are only partly within MSD's control.

What's New (September/October 2007)

1. (1-B-5-h) – Craft messages explaining the importance of addressing private sources of infiltration and inflow, and people's personal responsibility for addressing it.
2. (1-C-10-b-ii through xi) – Additional ideas for places/ways to advertise the public meetings.
3. (1-C-10-e) – Avoid using acronyms in presentations and discussions with community members.
4. (1-C-10-f) – Conduct direct outreach to block watch groups, neighborhood associations, and business associations to identify neighborhood leaders.
5. (1-C-10-g) – Give people at least two weeks advance notice of the public meetings.
6. (1-C-10-h) – Have the Metro Council representative for the local area host the public meetings.
7. (1-C-10-i) – Hold public meetings at local schools, maybe in conjunction with other meetings that are already taking place.
8. (1-C-10-j) – Give information that is as specific in terms of location as possible at the public meetings.
9. (1-C-10-k) – Advertise some of the potential solutions being considered, and hold the meetings near some of the likely places of disruption, as a way to get people to attend public meetings.

I. MSD Wet Weather Program Education and Outreach Efforts

A. Education/Outreach Program Characteristics

1. MSD should expand upon its existing education and outreach efforts, including Project WIN and other MSD programs such as Living Lands and Waters.
2. Education efforts should be comprehensive, adequately resourced, and human scale to encourage behavior changes (e.g., stewardship practices).
3. To be successful, public involvement efforts should include:
    a. A corporate or programmatic identity: logo, leader, advisory board, budget, mission, goals, website, etc.
    b. Communications: announcements, fliers, newsletters, radio/TV appearances, etc.

c. Stewardship: removing invasive vegetation from riparian zones, planting wetlands, [and yes] litter cleanups
d. Education: stream science, water quality monitoring
e. Conservation: promoting rain gardens, rain barrels, and responsible alternatives for sump pumps and downspout connections.
f. Coordination: linking the public involvement activity with MSD and the wet weather team
g. Celebration: festivals, canoe floats, and other events that call positive attention to the area's waterways.

4. Outreach efforts should show people that there is an open and transparent process within which MSD is making decisions on behalf of the community.

B. Audiences, Objectives, and Messages

1. Target education efforts in "critical CSO neighborhoods" and schools in those areas.
    a. Use a targeted direct-mail approach to help address local, site-specific problems.
2. Involve commercial and industrial customers and solutions through PR and planning, not just residential customers.
3. Make a presentation to the full Metro Council.
4. Work with schools (in conjunction with Earth Day and river/creek cleanups) to involve both students and parents.
5. Message ideas:
    a. Develop positive educational messages about the value of clean water to supplement other education and outreach messages. (CSO warning signs, river sweeps, and other elements of MSD's outreach activities send a negative message about the community's water resources.)
    b. Can the "water is dirty, stay away from it" signs that EPA designated include a promise that the public can change the situation?
    c. Translate Consent Decree activities into dollar impacts for residents.
    d. Communicate that we have no choice but must comply with the requirements of the consent decree in a timely manner.
    e. Help people understand how they are connected to the problem.
    f. Help change the perception people have of streams to a positive one (people think that streams are "dead").
    g. Help people understand that green infrastructure can be incorporated into urban areas, since urban areas can be redeveloped.
    h. Craft messages explaining the importance of addressing private sources of infiltration and inflow, and people's personal responsibility for addressing it.
6. Involve neighborhoods in identifying potential green infrastructure solutions (e.g., by having a neighborhood competition to get grassroots ideas for potential solutions).
7. Develop education programs for schools that allow children to take information home.

C. General Outreach and Education Strategies and Techniques

1. Use a variety of communication media to inform Louisville residents about issues, opportunities, and activities related to the Wet Weather Program and the Consent Decree. Examples include:
    a. feature articles and/or advertisements in the Courier Journal

b. direct mail
c. public service announcements on television
d. radio (WLOU/WLLV 1350 and 101.3 FM for the west)
e. e-mail lists ("UofL announcements" to University of Louisville employees, e-mail lists for Metro Council members)
f. website(s) (provide information, as well as solicit input and questions)
g. community meetings ("piggy back" on other events/meetings such as the Mayor's Night Out, community association meetings, Metro Council meetings, etc.)
h. media "groundbreaking" events
i. 5-minute DVD video (highlight the central issues and indicate the short and long-term consequences)
j. hold a "creek concert" to raise awareness of stream issues to young people
k. develop/use a Kentucky State Fair Exhibit (permanent or traveling)

2. Develop/use posters and visual displays to illustrate concepts to the public and provide context to Wet Weather Program activities. Specific suggestions include:
   a. Schematic of a combined sewer overflow
   b. Schematic of sump pumps and downspouts connected to sanitary sewers
   c. Map of the combined sewer area and outfalls against blue line streams and landmarks (road system would do)
   d. Map of SSO outfalls including the sewersheds of the "big four," as above
   e. Water Quality maps from the Beargrass Creek report card, also water quality info about Ohio River related to CSO outfalls
   f. Comparison of city sewer rates indicating which cities have consent decrees
   g. Time frames for the major deliverables in the Consent Decree
   h. Create visible representations of the solution, since they can be helpful for explaining project concepts to the public. Use these visual representations when soliciting community input.
3. Initiate a dialog with neighborhoods, potentially including door-to-door outreach, to better understand local water quality problems and to solicit local input on potential solutions.
4. Develop a speakers bureau to attend chamber/business association meetings and other groups that use speakers.
5. Conduct demonstration projects (Note: Overlaps with demonstration projects in Solution Ideas List). Specific ideas include:
   a. Create a demonstration area in each Jefferson County watershed to demonstrate and interpret healthy stream habitats and what MSD is doing to study and protect them.
   b. Strategically place demonstration projects (e.g., porous pavement) near neighborhoods.
   c. Create some sustainable lawns as pilot projects.
   d. Develop a green infrastructure best management practice site similar to SD1 (Sanitation District Number 1 of Northern Kentucky).
   e. Add green demonstration/education facilities to old urban schools.
   f. The Clifton neighborhood is motivated, so would be a good demonstration area to show the effects of behavior change.
   g. Use the Butchertown Greenway Pump Station that is offline for an education and demonstration facility.

6. Present "Where is your CSO or SSO?" information on-line: On the MSD or LOGIC website, have the ability to type in your address and have it call up the location of the CSO or SSO that the property owner's waste goes to. The website could describe the watershed that contributes water and runoff to that individual CSO or SSO.
7. Support the identification of public watershed advocates for each Jefferson County watershed. Each watershed needs a public advocate. It could be connected with a nature center, or be an independent citizen advocacy group.
8. Make MSD facilities visitor friendly. For example, add educational exhibits around the flood wall, the history of flooding, etc. to the Beargrass Creek Pump Station and near the flood detention basins at the Fairgrounds.
9. Have MSD employees be educational ambassadors, as a way of making Louisville environmentally literate.
10. Public meeting ideas:
    a. To increase attendance, consider latching onto other meetings.
    b. Ideas for places/ways to advertise the public meetings:
        i. Churches
        ii. PTA meetings.
        iii. Metro Council and neighborhood newsletters
        iv. Channel 25 (Metro Louisville programming)
        v. Short recorded messages on phones
        vi. Send announcements about the public meetings through the Department of Neighborhoods distribution list to get word out to neighborhood groups.
        vii. Listservs
        viii. Get the word out at local schools so kids can take information home to their parents.
        ix. Local TV or NPR piece
        x. Homeowners Association newsletters
        xi. Suburban city newsletters
    c. Start public meeting presentations with information on rates to get people's attention.
    d. At public meetings, consider the fact that people need time to digest information from presentations and written materials.
    e. Avoid using acronyms in presentations and discussions with community members.
    f. Conduct direct outreach to block watch groups, neighborhood associations, and business associations to identify neighborhood leaders.
    g. Give people at least two weeks advance notice of the public meetings.
    h. Have the Metro Council representative for the local area host the public meetings.
    i. Hold public meetings at local schools, maybe in conjunction with other meetings that are already taking place.
    j. Give information that is as specific in terms of location as possible at the public meetings.
    k. Advertise some of the potential solutions being considered, and hold the meetings near some of the likely places of disruption, as a way to get people to attend public meetings.
11. Add a portal to MSD's website where people can submit comments on Project WIN; run a public service announcement to inform people about the issues and the website address for submitting comments.

12. Develop and run an information booth at selected festivals in the community (similar to the booth used for Project XL).
13. Use the potential disruption along Hikes Lane (part of the Big Four SSO plan) as an opportunity for broader education of the public about wet weather sewer overflow issues.
14. Yard signs similar to those used in Portland's residential Downspout Disconnection Program could be useful for education and outreach about MSD's Wet Weather Program. *[Note: Overlaps with CSO and SSO Point Source Controls in Solution Ideas List.]* Specific ideas for signs include:
    a. Messages such as "I disconnected my downspout" and/or "I have a rain barrel."
    b. The bottom of the sign could invite readers to "ask me" for more information.

D. Education to Change Behavior [Overlaps with Behavior Change Strategies in Solution Ideas List]

1. Influence behavior of residential and commercial landowners through education.
    a. Promote water conservation practices: rain gardens, rain barrels, and responsible alternatives for sump pumps and downspout connections.
    b. Encourage stewardship: removing invasive vegetation from riparian zones, planting wetlands, litter cleanups, etc.
    c. Conduct education regarding fertilizer, weed killer, and other stormwater best management practices to neighborhood groups.
    d. Develop and educate residents about urban farming opportunities
    e. Teach and promote sensible/responsible development.
    f. Discourage chemical treatment and mowing near waterways to help keep debris from waterways.
2. Regularly distribute billing inserts (like LG&E's) to MSD customers with facts and tips to encourage certain behaviors (e.g., lawn chemical management, pet waste management, landscaping practices).
3. Hold "CSO Action Days" (like Ozone Action Days) during or right after a hard rain to raise awareness and promote behavior change (e.g., don't use your dishwasher or clothes washer, wait to drain your bathtub, etc.).
4. Develop a pledge for customers that clearly lays out behaviors that will help MSD meet Consent Decree requirements. For an example, see http://www.watershedpledge.org
5. Encourage the use of best management practices for chemical use in lawn management practices.
    a. Inform greens keepers about best management practices (BMPs), since non-point source runoff is made worse by golf course chemicals.
6. Provide technical assistance to support behavior-change efforts.
    a. Develop a program in which residents could pay a small fee for MSD or another agency to conduct a water/wastewater audit on a house similar to the energy audits offered by LG&E.

E. Monitoring, Evaluation, and Accountability

1. Conduct a baseline survey and follow-up surveys of residents to determine whether education and outreach efforts are effective in raising awareness and in changing behavior and perceptions on issues related to the Wet Weather Program. [Note: This is also included in the Solution Ideas List.]
    a. Develop a survey instrument (potentially with a coalition of cities) and use it every year.

2. Collect baseline data, monitor performance, and ensure "high stakes accountability" for all of the education and outreach objectives of the Wet Weather Program.
    a. Evaluate the extent to which citizens value clean water, support MSD, understand best management practices for homes and businesses, and have a basic understanding of ecological conditions and processes.
3. Consider creating/supporting an evaluation center to evaluate and document the effectiveness of education and outreach programs.
4. Develop a "report card" for MSD's Wet Weather Program to post on MSD's Project WIN website and publish it in print format regularly (e.g., annually). This report card would report on performance measures related to the goals of MSD's Wet Weather Program and implementation of the consent decree.

II. Ideas Partly or Completely Outside the Scope of MSD's Wet Weather Consent Decree

A. *Municipal Government Actions (Only Partly within MSD's Control)*

1. Develop a "comprehensive solution" for local environmental improvement and education efforts.
    a. Fund and staff a collaborative planning effort to link the environmental education programs of multiple local agencies (MSD, Louisville Water Company, Metro government departments, Mayor's Office, TARC, etc.) together, develop specific goals and assessment systems, and then hold agencies accountable to those goals.

    [Note: This is also included in the Solution Ideas List.]
2. Transform governmental facilities to be role models and learning laboratories—demonstrate how to do the right thing.
    a. Encourage local government agencies (e.g., Jefferson County Public Schools, Metro Parks) to adopt preventative practices to decrease stormwater runoff and wastewater volumes (e.g., low-flow toilets, pervious pavement, additional tree coverage, etc.).

    [Note: This is also included in the Solution Ideas List.]
3. Work with other building inspectors to raise awareness of wet weather issues during inspections.

Wet Weather Team Data Request and Monitoring Suggestions List
Working Draft – October 12, 2007

The following is a list of data requests and monitoring suggestions made by Wet Weather Team (WWT) members for consideration for the Wet Weather Program. This includes requests for information to support the WWT's deliberations and suggestions for the research, monitoring, and evaluation efforts associated with MSD's Wet Weather Program. These ideas were identified both at WWT meetings and through individual communications with WWT members (e.g., via e-mail). This list will remain "live" throughout the remainder of the WWT effort, and WWT members are encouraged to send additional suggestions to the facilitation team. Requests that have been responded to will be kept on this list, but marked as "Addressed." New ideas will be listed under a "What's New" section at the beginning of the document for easy reference, as well as under the appropriate section later in the document.

Note: For monitoring and evaluation suggestions related to the Wet Weather Program public education and outreach plan, please see the Wet Weather Team Education and Outreach Idea List.

What's New (September/October 2007)

Please note that we have reorganized the list into two major sections:

- Section I, "Requests for Information to Support WWT Deliberations," is organized into three sub-categories: Requests for Information on Current Conditions, Requests for Information on the Effectiveness of Potential Solutions, and Process Suggestions. Items under each sub-category are marked by the status of the request (addressed, not addressed, or ongoing).
- Section II, "Suggestions Related to the Wet Weather Program Monitoring, Evaluation, and Research Plan," is organized into four sub-categories: Suggestions Related to Water Quality and Public Health Monitoring, Suggestions Related to the Effectiveness of Green Infrastructure Projects, Suggestions Related to the Effectiveness of Behavior Change Efforts, and Other Suggestions.

Specific requests added to the list this month are as follows:

1. (I-C-2) – Conduct additional analysis of the potential effects of behavior change and green infrastructure strategies at reducing flows into MSD's sewer systems.
2. (I-B) – Additional information on the benefits and challenges of different control approaches (e.g., why a storage solution might be preferable to a transport solution for a particular area).
3. (II-A-4) – Involve the research community (e.g., students at the University of Louisville's School of Public Health) in water quality monitoring and data analysis.
4. (II-A-5) – Consider whether to use EPA's quality control protocols for water quality monitoring efforts.
5. (II-C-1) – Conduct separate research and data analysis to supplement any data collected through surveys about people's behavior.

I. Requests for Information to Support WWT Deliberations

A. Requests for Information on Current Conditions

1. Data on how fecal coliform levels change with flow volumes.
2. Data on where water quality sampling is currently done in relation to recreational areas.
3. Current data MSD has on water quality in stream reaches (as aquatic health is an issue in some, but not all, stream reaches).
4. How MSD's development fees compare to development fees in other places.
5. Specific information on the percentage of backups that are the result of MSD's activities as opposed to private property issues.
6. Cincinnati's rates before the community started to respond to its consent decree.
7. Information on the "root causes" of wet weather CSO and SSO problems (e.g., the CSO volume attributable to residential downspouts) to assist with Wet Weather Program decision making. *[Note: This is an ongoing request.]*

B. Requests for Information of the Effectiveness of Potential Solutions

1. Information on the long-term effectiveness of strategies that rely on source prevention (e.g., rain gardens).
2. Quantitative information on the benefits and/or effectiveness of eco-friendly solutions currently used by MSD.
3. Additional information on the benefits and challenges of different control approaches (e.g., why a storage solution might be preferable to a transport solution for a particular area). *[Note: This is an ongoing request.]*

C. Process Suggestions

1. Conduct assessments of different watersheds to find the best opportunities for green infrastructure.
2. Conduct additional analysis of the potential effects of behavior change and green infrastructure strategies at reducing flows into MSD's sewer systems.

II. Suggestions Related to the Wet Weather Program Monitoring, Evaluation, and Research Plan

A. Suggestions Related to Water Quality and Public Health Monitoring

1. Consider monitoring water quality and flow at additional locations, based upon the Wet Weather Program's objectives and the performance measures developed for the program. Potential new monitoring locations to consider include:
   a. Intensely used public access sites within Beargrass Creek
   b. Stream segments MSD does not monitor currently, such as Buechel Branch and upper South Fork of Beargrass Creek
   c. Additional locations within the Floyds Fork watershed
2. Environmental performance data such as biological indexes of aquatic health (fish counts, macro-invertebrate sampling, etc.), nutrient sampling, downstream pollutant load, and tree cover or other measures of habitat restoration efforts.

3. Data on the public health impacts of polluted water (collected by the School of Public Health or the Health Department and included in an annual report).
4. Involve the research community (e.g., students at the University of Louisville's School of Public Health) in water quality monitoring and data analysis.
5. Consider whether to use EPA's quality control protocols for water quality monitoring efforts.

B. Suggestions Related to the Effectiveness of Green Infrastructure Projects

1. Build monitoring components into green infrastructure projects to help demonstrate the overall effectiveness of green infrastructure solutions.
2. Pick a CSO catchment area and study the effects of rain barrels and rain gardens.
3. In order to gain information on the long-term effectiveness of strategies that rely on source prevention, conduct a demonstration project in a small area, and compare the changes in pollutant loading and stormwater flows to those of other areas.

C. Suggestions Related to the Effectiveness of Behavior Change Efforts

1. Conduct separate research and data analysis to supplement any data collected through surveys about people's behavior.

D. Other Suggestions

1. Monitor customer satisfaction data (e.g., number of hits on MSD's website, number of requests for information, customer satisfaction surveys).

water environment federation

Private Property Virtual Library

www.wef.org/PrivateProperty

Water Environment Federation
Collection System Committee
With assistance from FMSM Engineers

Introduction

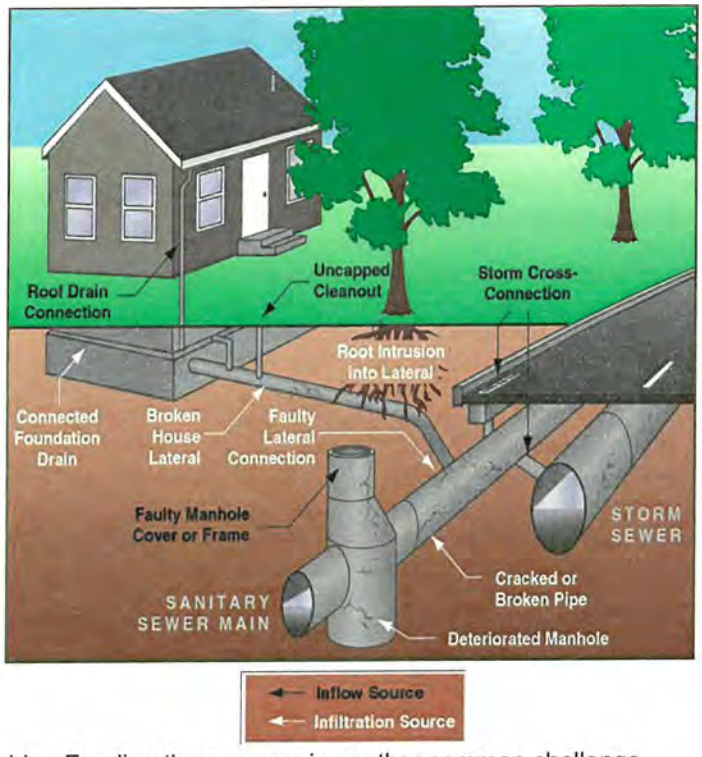
As the collection systems in the US age, inflow and infiltration (I/I) is a significant problem. It is estimated that 27% of all sanitary sewer overflows are caused by I/I. Some cities estimate that as much as 60% of the flow that overfills their sanitary sewers comes from service connections (EPA 832-K-96-001). The WEF Collection Systems Committee (CSC) recognizes that private property I/I sources and lateral maintenance are some of the most difficult issues that many wastewater utilities face. To support utilities in managing private property issues, the WEF CSC has information on successful private property programs and is making this information available in a virtual library.

Why is Private Property an issue?

Regulatory authorities are requiring utilities to eliminate overflows. One approach to eliminating overflows is removing I/I. However, if removing public I/I sources alone is not enough, utilities are faced with the dilemma of constructing large storage structures or going onto private property.

There are many potential private property I/I sources including:

- Illicit connections to the public sewer main, such as downspouts, basement sumps, and foundation drains, and
- Breaks and open joints in the private laterals sewer that result from improper construction, improper repair, or lack of maintenance.



Additionally, many state regulatory agencies are requiring utilities to include sewer lateral installation, inspection and maintenance issues in their Capacity, Management, Operations and Maintenance (CMOM) programs.

There are many roadblocks that prevent utilities from implementing a private property program. Many communities don't know where to begin. Often it is difficult working on private property because of legal issues as well as easements and defining ownership. Funding the program is another common challenge because of limited funds to undertake the necessary repairs as well as the question of spending public money on private property. Additionally, it can be difficult to gain stakeholder support to initiate the programs.

Private Property Virtual Library (PPVL) Project Objective and Approach

In August 2005, WEF conducted a webcast on private property issues that was the highest viewed webcast WEF had ever sponsored. Participants requested example ordinances, letters, and other documents from speakers, which led the WEF CSC to begin this project to collect and share this type of information.

The project objective was to develop a virtual library of private property program-related resource materials to be available through the internet. It was decided that initial project efforts should focus on "successful" private property programs targeting sanitary lateral repair or replacement, I/I source detection and elimination, and lateral condition assessment. Building a dynamic library repository and virtual library website were also part of the initial project efforts.

To date, over 20 utilities have shared detailed information on their successful programs from California to South Carolina, from Texas to Michigan. WEF CSC intends to update and expand the information as more communities share their successes. As other private property related challenges are identified (e.g., sewer easements), the library will be modified to accommodate additional issues. Data will continue to be collected and uploaded by the WEF CSC as it becomes available.

Private Property Virtual Library (PPVL) Content

The PPVL includes information on several different types of programs that have been implemented. Some communities opted to implement programs that included full replacement of the sanitary lateral, replacement from sewer main to right-of-way or curb, repair using pipe liners (these methods are completed in conjunction with sewer main replacement or rehabilitation), and emergency repairs. Some communities implemented maintenance programs that focused on sanitary lateral cleaning and cleanout installation.

Another group of communities implemented programs that focused on less direct municipal construction. These programs included enforcement of homeowner repairs, dye testing of all connections, downspout extension or disconnection, sump pump disconnection, footing drain disconnection, and installation of backflow prevention devices.

How to Access the Private Property Virtual Library (PPVL)

The PPVL is located at:
www.wef.org/PrivateProperty.

Documentation online includes completed questionnaires and supporting documentation, such as public education materials, letters to residents, ordinances and codes, operating and maintenance procedures, design details and specifications. The library has multiple search options, such as utility location, program type, supporting documents. A discussion board focused on private property issues is also included.

If your utility has a private property program in place and is willing to share related information, please contact PPVL Project Chair Laurie Chase (614.844.4004 lchase@fmsm.com) or PPVL Project Vice-Chair Jaime Davidson (716.541.0745 jaime.davidson@parsons.com).

5/24/07

Draft Outline - Integrated Wet Weather Plan

Volume 1 of 3 - Integrated Wet Weather Plan (WWP)

Chapter	Section	Sub-section 1	Integrated Wet Weather Plan Heading	Description
0			***Executive Summary***	Summarize key items to provide overview fo report
1			***Introduction***	
	1.1		**Background**	Background of program; how we got to where we are and where we are headed
	1.2		**Wet Weather Overflows**	Define wet weather overflows - CSO and SSO
	1.3		**Governing Laws and Consent Decree**	Summary of regulatory and consent decree requirements
	1.4		**Wet Weather Document Organization**	Brief discussion of report layout, Volume 1 - WWP, Volume 2 - LTCP, Volume 3 - SSDP
2			***MSD Vision and Wet Weather Improvement Program***	
	2.1		**MSD Vision**	
	2.2		**MSD Wet Weather Improvement Program Principles**	
		2.2.1	Watershed Approach	Wholistic approach to water quality improvements including source reduction through constructed and behavior modification solutions, partnerships with other Metro agencies, and end of pipe solutions that include both "grey" and "green " infrastructure
		2.2.2	Benefit/Cost "knee of the curve"	Evaluate alternatives based on benefit/cost ratio, looking for the point of diminishing returns to ensure the proper use of community resources.
		2.2.3	Risk Management	Evaluations consider both the propbablity of occurance and the severity of the resulting consequences - reduction in risks is one form of "benefit" used in the benefit/cost analysis
		2.2.4	Community values	Risk management principles are applied to potential threats to community values as defined by a representative group of community leaders
3			***Wet Weather Planning Approach Summary***	
	3.1		**Public Participation and Agency Interaction**	Define how public and other agencies will or have been involved in the process
		3.1.1	Wet Weather Team and the Stakeholder Group	Describes the Wet Weather Team, the make-up of the Stakeholder Group, the identification and weighting of community values. Appends meeting minutes, copies of presentations, idea lists, and all other materials developed during the WWT meetings
		3.1.2	Public Outreach	Describes the public meetings held throughout the planning process including the general information meetings, three rounds of public input meetings, and other meetings held with community and interest groups relative to the Consent Decree response and the wet weather planning process
		3.1.3	Public Information and Education	Identifies the various information and education efforts including the development of the message(s), identifying target audiences for each message, and developing specific information and education materials, that will be appended to the plan.
		3.1.4	Public and Regulatory Notification	Describes public notification efforts including permanent CSO and SSO signs, temporary overflow warning signs, email notification of events (public and regulators), web page notification etc.
		3.1.5	Agency Interaction	Describes meetings, correspondence, conference calls, and regular reporting activities with state and federal regulators
		3.1.6	Public Hearing	Describes the notification of the availability of the Wet Weather Plan for review, the advertising and content of the public hearing, the comments received at the hearing and during the comment period, and the response to comments
	3.2		**Measures of Success**	Define criteria for establishing whether projects attain the expected results; describe stakeholder values
4			***Integrated Wet Weather Program***	
	4.1		**Early Action Projects**	Describe completion of the Early Action Projects identified in the Consent Decree
	4.2		**Combined Sewer Service Area Improvements**	Summarize the project lists developed in Volume 2
	4.3		**Sanitary Sewer Service Area Improvements**	Summarize the project lists developed in Volume 3
	4.4		**Wastewater Treatment Plant Improvements**	Provide a consolidated overview of wastewater treatment plant projects required to support the LTCP and SSDP
	4.5		**Source Control and Capacity Sustainability Programs**	Discussion of the sewer inspection, cleaning and maintenance programs implemented under the CMOM program to reduce I&I, keep sewers flowing at full capacity, and ensure that capacity is available to meet current and future needs. Also will describe MSD's private property I&I reduction approach.
	4.6		**Community-Wide Green Infrastructure Initiatives**	Discussion of the overall green infrastructure initiative including constructed projects, cooperative efforts with partners, and voluntary and behavior modification approaches to reduce flows and loads.
5			***Regulatory Compliance***	
	5.1		**Meeting Concent Decree Requirements**	A "road map" describing the approaches taken to comply with requirements of the Consent Decree, and the location in the Wet Weather Plan of the various elements of compliance.
	5.2		**Meeting Water Quality Criteria and CSO Policy Requirements**	

		5.2.1	Water quality standards review	Completion of the water quality standards review required by CSO Policy if CSO controls alone cannot consistently achieve established water quality standards.
		5.2.2	Evaluation of approaches to water quality standards compliance	Summary of approved compliance approaches, particularly in EPA Region IV
		5.2.3	Selection of recommended approach to CWA and CSO Policy compliance	
	5.3		**Eliminating Unauthorized Discharges from the Sewer System**	
		5.3.1	Inventory of approaches and design event standards used by other agencies	Summary of approved design event standard approaches, particularly in EPA Region IV
		5.3.2	Evaluation of design event "knee of the curve"	
		5.3.3	Boundary conditions and role of site-specific cost benefit analysis in developing specific design event standards	
	5.4		**Created an Approved CSO LTCP**	Road map explaining how the LTCP complies with applicable regulations and guidelines, and should be considered approvable by the regulators
	5.5		**Created an Approved SSO SSDP**	Road map explaining how the SSDP complies with applicable regulations and guidelines, and should be considered approvable by the regulators
6			***Wet Weather Program Implementation***	
	6.1		**Public Participation and Agency Interaction**	Explain how the public and affected agencies are involved in the evaluation of implementation approaches
	6.2		**Operational Plan**	Program to provide the staff, equipment and facilities needed to implement and sustain the recommendations of the Wet Weather Plan
		6.2.1	Current Operating Budgets	
		6.2.2	Added Operating Resouces needed for new facilities constructed under Wet Weather Plan	
		6.2.3	Added operating resources needed due to CMOM and other operating programs	
	6.3		**Implementation Schedule**	
		6.3.1	Consolidated Project Lists and Milestones	
		6.3.2	Evaluation of Programatic Value compliance	
		6.3.3	Consideration of other Implementation issues	
		6.3.4	Consolidated Wet Weather Plan Schedule	
	6.4		**Financial Plan**	
		6.4.1	Capital Funding Options	Evaluation of the various capital funding options such as grants, loans, revenue bonds, or pay-as-you-go funding
		6.4.2	Projected Cash Flow and Revenue Requirements	Consolidation of projected capital and O&M spending, considering the entire Consent Decree response including the Wet Weather Plan, CMOM, and other future funding requirements that impact MSD required revenues
		6.4.3	Affordability Analysis	Evaluation of the impact on projected revenue requirements on the communities ability to pay
		6.4.4	Rates and Fees	Discussion of the ways MSD can generate revenue, and a discussion of potential rate structures, incentives, subsidies etc. to allow community acceptance of the rate increases needed to support the Wet Weather Plan and other Consent Decree response requirements
		6.4.5	Selection of Financing Method	Description of the proposed financing method and revenue recovery
	6.5		**Post-Construction Compliance Monitoring**	Discussion of process to determine success of projects
		6.5.1	Project Performance Testing	Procedures established to document constructed project conformance with project requirements
		6.5.2	Short-term Project Monitoring and Certification	Monitoring approach to document the impact of source reduction, green infrastructure, public education and other behavior modification initiatives.
		6.5.3	Sewer System Monitoring	Description of the on-going sewer system monitoring program, including permanently installed monitors, and decision criteria used to determine when temporary monitoring is indicated
		6.5.4	Sewer System Model Updates	Periodic review and recalibration of MSD's integrated hydraulic models to represent the impacts of Wet Weather Plan project progress
		6.5.5	Receiving Water Monitoring	Program to monitor and report on trends in water quality across Jefferson County, including but not limited to the Ohio River and Beargrass Creek.
		6.5.6	Water Quality Model Updates	Periodic review and recalibration of MSD's water quality models for the Ohio River and Beargrass Creek to represent the impacts of Wet Weather Plan project progress
	6.6		**Re-Evaluation and Update**	Define timing, methodology used to re-evaluate and update CIP based on "real" project results.

Volume 2 of 3 - Combined Sewer Overflow Long-Term Control Plan (LTCP)

Chapter	Section	Sub-section 1	Sub-section 2	Combined Sewer Overflow Long-Term Control Plan Heading	Description
0				***Executive Summary***	Summarize key items to provide overview to report
1				***Introduction***	
	1.1			**Background**	Background of program; how we got to where we are and where we are headed
	1.2			**History of CSO Control Policy**	Very general description, but will be included early in document to provide comfort to regulators that we are proceeding within the policy
	1.3			**Key Elements of CSO Control Policy**	Brief summary of those key elements relative to the MSD Program
	1.4			**Guidance to Support Implementation of the CSO Control Policy**	
	1.5			**Document Organization**	Brief discussion of report layout
	1.6			**Long Term Planning Approach Summary**	
		1.6.1		Initial Activities	
		1.6.2		Public Participation and Agency Interaction	Discusion of how overall Public Participation and Agency Interaction (described in Vol 1) impacted specific LTCP issues
		1.6.3		Coordination with State Water Quality Standards Authority	Overview of Water Quality Standards Review, future BGC TMDL and possibly the Pat Bradley figure
		1.6.4		Integration of Current CSO Control Efforts	Rely on Section 8 of the Interim CSO LTCP previously prepared
		1.6.5		Watershed Approach to CSO Control Planning	Summarize overall approach to green infrastructure, non-point source controls, separating upstream SSS from the CSS as part of SSDP to make room for CSS flows and vice-versa
		1.6.6		Sensitive Areas and Priority Areas	
		1.6.7		Measures of Success	Describe how stakeholder values help define LTCP success
2				***System Characterization***	
	2.1			**Objective of System Characterization**	Define goal of system Characterization
	2.2			**Implementation of Nine Minimum Controls**	Rely heavily on previous NMC Consent Decree documents
		2.2.1		Existing Baseline Conditions	Establish starting status
		2.2.2		Summary of Minimum Controls	Discuss progress towards implementation
	2.3			**Compilation and Analysis of Existing Data - Summary**	Utilize text prepared in Interim CSO LTCP. For discussion purposes, the document is broken up by Ohio River and Beargrass Creek, but further divisions are possible if they would add clarity.
		2.3.1		Watershed Mapping	
		2.4.2		Collection System Understanding	
		2.4.3		CSO and Non-CSO Source Characterization	
		2.4.4		Field Inspections	
		2.4.5		Receiving Water Quality	
	2.4			**Compilation and Analysis of Existing Data - Bear Grass Creek**	
		2.4.1		Watershed Mapping	
		2.4.2		Collection System Understanding	
		2.4.3		CSO and Non-CSO Source Characterization	
		2.4.4		Field Inspections	
		2.4.5		Receiving Water Quality	
	2.5			**Compilation and Analysis of Existing Data - Ohio River**	
		2.5.1		Watershed Mapping	
		2.5.2		Collection System Understanding	
		2.5.3		CSO and Non-CSO Source Characterization	
		2.5.4		Field Inspections	
		2.5.5		Receiving Water Quality	
	2.6			**Combined Sewer System and Receiving Water Monitoring Summary**	The proposed organization allows for a programmatic summary of how the monitoring and analysis was established and an individual summary of the actual watershed analysis.
		2.6.1		Monitoring Plan Development	
		2.6.2		Combined Sewer System Monitoring	
			2.6.2.1	Selection of Monitoring Stations	
			2.6.2.2	Frequency of Monitoring	
			2.6.2.3	Pollutant Parameters	
			2.6.2.4	Rainfall Monitoring and Analysis	
			2.6.2.5	CSO Flow Monitoring	
			2.6.2.6	CSO Quality Sampling	
			2.6.2.7	CSO Flow Monitoring Analysis - Summary	
			2.6.2.8	CSO Quality Sampling Analysis - Summary	
			2.6.2.9	CSO Flow Monitoring Analysis - Ohio River	
			2.6.2.10	CSO Quality Sampling Analysis - Ohio River	
			2.6.2.11	CSO Flow Monitoring Analysis - Beargrass Creek	
			2.6.2.12	CSO Quality Sampling Analysis - Beargrass Creek	
		2.6.3		Receiving Water Monitoring	
			2.6.3.1	Selection of Monitoring Stations	
			2.6.3.2	Extent of Monitoring	
			2.6.3.3	Pollutant Parameters	
			2.6.3.4	Hydraulic Monitoring	
			2.6.3.5	Receiving Water Quality Monitoring	
			2.6.3.6	Sediment and Biological Monitoring	
			2.6.3.7	Hydraulic Monitoring Analysis - Summary	
			2.6.3.8	Receiving Water Quality Monitoring Analysis - Summary	
			2.6.3.9	Sediment and Biological Monitoring Analysis - Summary	
			2.6.3.10	Hydraulic Monitoring Analysis - Ohio River	

Chapter	Section	Sub-section 1	Sub-section 2	Combined Sewer Overflow Long-Term Control Plan Heading	Description
			2.6.3.11	Receiving Water Quality Monitoring Analysis - Ohio River	
			2.6.3.12	Sediment and Biological Monitoring Analysis - Ohio River	
			2.6.3.13	Hydraulic Monitoring Analysis - Beargrass Creek	
			2.6.3.14	Receiving Water Quality Monitoring Analysis - Beargrass Creek	
			2.6.3.15	Sediment and Biological Monitoring Analysis - Beargrass Creek	
	2.7			**Combined Sewer System and Receiving Water Modeling**	
		2.7.1		Combined Sewer System Modeling	
			2.7.1.1	CSS Modeling Objectives	
			2.7.1.2	CSS Model Selection	
			2.7.1.3	CSS Model Application	
		2.7.2		Receiving Water Modeling	
			2.7.2.1	Receiving Water Modeling Objectives	
			2.7.2.2	Receiving Water Model Selection	
			2.7.2.3	Receiving Water Application	
3				***Development and Evaluation of Alternatives For CSO Control***	
	3.1			**Long Term Control Plan Approach**	
		3.1.1		Demonstration verses Presumption Approach	
		3.1.2		Decision Process	
			3.1.2.1	Cost Model	
			3.1.2.2	Benefit Cost Analysis	
			3.1.2.3	Public Participation	
	3.2			**Development of Alternatives**	
		3.2.1		General Considerations and CSO Control Measures and Available Technologies	Discussion of overall methods available for CSO control, including full suite of "grey" and "green" approaches
			3.2.1.1	Interaction with Nine Minimum Controls	
			3.2.1.2	Interaction with Other Collection and Treatment System Objectives	
			3.2.1.3	Approach to Green Infrastructure	Description of the process used to identify Green Infrastructure opportunities
		3.2.2		Definition of Water Quality and CSO Control Goals	
		3.2.3		Approaches to Structuring CSO Control Alternatives	
			3.2.2.1	Projects Common to All Alternatives	Includes county-wide Green Infrastructure programs
			3.2.2.2	Outfall-Specific Solutions	
			3.2.2.3	Localized Consolidation of Outfalls	
			3.2.2.4	Regional Consolidation	
			3.2.2.5	Utilization of MFWTP POTW Capacity	
			3.2.2.6	Consideration of Sensitive Areas and Priority Areas	
	3.3			**Evaluation of CSO Control Alternatives**	Value based process, inclusive of Green infrastructure
		3.3.1		Project Costs	
		3.3.2		Performance	
		3.3.3		Cost/Performance Evaluations	
		3.3.5		Rating and Ranking of Alternatives	
4				***Selection of Long-Term Plan***	
	4.1			**Public Participation and Agency Interaction**	Explain how the public involvment process at all levels was involved in the evaluation process
	4.2			**Final Selection and Development of Recommended Plan**	Documentation of final CIP
		4.2.1		Knee of the Curve Evaluation (design event vs. cost)	
		4.2.2		Programatic Values and Other Non-Monetary Factors	
			4.2.2.1	Environmental Issues/Impacts	
			4.2.2.2	Technical Issues	
		4.2.4	4.2.2.3	Implementation Issues	
		4.2.3		Prioritization of Projects	
		4.2.3		Implementation Schedule to Achieve Consent Decree Requirements	

Volume 3 of 3 - Sanitary Sewer Discharge Plan (SSDP)

Chapter	Section	Sub-section 1	Sub-section 2	Sub-section 3	Sanitary Sewer Discharge Plan Heading	Description
1					***Introduction***	
	1.1				**Background**	
	1.4				**Document Organization**	Brief discussion of report layout
	1.5				**Planning Approach Summary**	
		1.5.1			Previous Studies/Planning (SSOP)	Summary of SSOP with references identifying relation to planning process
		1.5.2			CMOM	Summary of CMOM with references identifying relation to planning process
		1.5.3			SORP	Summary of SORP with references identifying relation to planning process
		1.5.4			ISSDP	Summary of ISSDP with references identifying relation to planning process
		1.5.5			Capacity Assessment and System Improvements development	Summary of planning process
		1.5.6			Public Participation and Agency Interaction	Discusion of how overall Public Participation and Agency Interaction (described in Vol 1) impacted specific LTCP issues
		1.5.7			Measures of Success	Define criteria for establishing whether projects attain the expected results
2					***System Characterization***	
	2.1				**Objective of System Characterization**	Define goal of system Characterization
	2.2				**Implementation of CMOM and SORP**	
		2.2.1			Existing Baseline Conditions	establish starting status of CMOM and SORP
		2.2.2			Summary of CMOM	Discuss progress towards implementation
		2.2.3			Summary of SORP	Discuss progress towards implementation
	2.3				**Compilation and Analysis of Existing Data**	
		2.3.1			Service Area Mapping	Mapping of service areas identifying key featrures and system layout - should be the base mapping used to document CA and SI results.
			2.3.1.1		Cedar Creek	
			2.3.1.2		Floyd's Creek	
			2.3.1.3		Hite Creek	
			2.3.1.4		Jeffersontown	
			2.3.1.5		Morris Forman	
				2.3.1.5.1	Middle Fork (Middle Fork Trunk)	
				2.3.1.5.2	Muddy Fork (ORFM/Muddy Fork)	
				2.3.1.5.3	South Fork (Beargrass and Northern Ditch)	
			2.3.1.6		Prospect	
			2.3.1.7		Small WTP's	
			2.3.1.8		West County	
		2.3.2			Collection System Understanding	
			2.3.2.1		Baseline Condition	
			2.3.2.2		WTP Capacity Evaluation	
			2.3.2.3		SSO Characterization	
		2.3.3			System Monitoring	
			2.3.3.1		Temporary Flow Monitoring	
			2.3.3.2		Permanent Flow Monitoring	
			2.3.3.3		Rain Gage Network	
		2.3.4			Receiving Water Quality	Include this section to demonstrate improvement of stream water quality related to SSO reduction.
	2.4				**Modeling History**	Discuss historic modeling efforts identifying coverage area, uses, etc...
	2.5				**Modeling Programs Objectives**	Document goals of the modeling program and anticipated future model uses (capacity assurance, evaluating impacts of executed projects, etc....)
	2.6				**Conveyance System Modeled Baseline Condition**	Documentation of capacity assessment results
		2.6.1			Cedar Creek	
		2.6.2			Floyd's Creek	
		2.6.3			Hite Creek	
		2.6.4			Jeffersontown	
		2.6.5			Morris Forman	
			2.6.5.1		Middle Fork (Middle Fork Trunk)	
			2.6.5.2		Muddy Fork (ORFM/Muddy Fork)	
			2.6.5.3		South Fork (Beargrass and Northern Ditch)	
		2.6.6			Prospect	
		2.6.7			Small WTP's	
		2.6.8			West County	
3					***Development and Evaluation of Alternatives For SSO Abatement***	
	3.1				**Sanitary Sewer Discharge Plan Approach**	Explain how methodology described in Vol. 1 was used to evaluate SSO solutions
		3.1.1			Decision Process	
			3.1.1.1		Cost Model	
			3.1.1.2		Benefit Cost Analysis	
			3.1.1.3		Design Storm Selection	
		3.1.2			Public Participation	
	3.2				**Development of SSO Abatement Alternative**	
		3.2.1			SSO Control Measure And Technologies	Define methods available to achieve and applicability to SSO Elimination/control.

Chapter	Section	Sub-section 1	Sub-section 2	Sub-section 3	Sanitary Sewer Discharge Plan Heading	Description
			3.2.1.1		Flow Reduction	Includes both private and public side I&I reduction approaches and methods to predict effectiveness
			3.2.1.2		Storage	
			3.2.1.3		Remote Treatment	
			3.2.1.4		Conveyance	
		3.2.2			SSO Abatement Alternatives	Identification of SSO abatement scenarios for evaluation and preliminarty mapping as needed.
			3.2.2.1		Cedar Creek	
			3.2.2.2		Floyd's Fork	
			3.2.2.3		Hite Creek	
			3.2.2.4		Jeffersontown	
			3.2.2.5		Morris Forman	
				3.2.2.5.1	Middle Fork (Middle Fork Trunk)	
				3.2.2.5.2	Muddy Fork (ORFM/Muddy Fork)	
				3.2.2.5.3	South Fork (Beargrass and Northern Ditch)	
			3.2.2.6		Prospect	
			3.2.2.7		Small WTP's	
			3.2.2.8		West County	
	3.3				**Evaluation of SSO Abatement Alternatives**	Documentation and evaluation of proposed solutions including selection of prefered projects with context of B/C analysis.
		3.3.1			Cedar Creek	
			3.3.1.1		Feasibility Screening	
			3.3.1.2		Modeling	
			3.3.1.3		Ground Truthing	
			3.3.1.4		Cost Estimating	
			3.3.1.5		Benefit/Cost Analysis	
		3.3.2			Floyd's Fork	
			3.3.2.1		Feasibility Screening	
			3.3.2.2		Modeling	
			3.3.2.3		Ground Truthing	
			3.3.2.4		Cost Estimating	
			3.3.2.5		Benefit/Cost Analysis	
		3.3.3			Hite Creek	
			3.3.3.1		Feasibility Screening	
			3.3.3.2		Modeling	
			3.3.3.3		Ground Truthing	
			3.3.3.4		Cost Estimating	
			3.3.3.5		Benefit/Cost Analysis	
		3.3.4			Jeffersontown	
			3.3.4.1		Feasibility Screening	
			3.3.4.2		Modeling	
			3.3.4.3		Ground Truthing	
			3.3.4.4		Cost Estimating	
			3.3.4.5		Benefit/Cost Analysis	
		3.3.5			Morris Forman	
			3.3.5.1		Middle Fork (Middle Fork Trunk)	
				3.3.5.1.1	Feasibility Screening	
				3.3.5.1.2	Modeling	
				3.3.5.1.3	Ground Truthing	
				3.3.5.1.4	Cost Estimating	
				3.3.5.1.5	Benefit/Cost Analysis	
			3.3.5.2		Muddy Fork (ORFM/Muddy Fork)	
				3.3.5.2.1	Feasibility Screening	
				3.3.5.2.2	Modeling	
				3.3.5.2.3	Ground Truthing	
				3.3.5.2.4	Cost Estimating	
				3.3.5.2.5	Benefit/Cost Analysis	
			3.3.5.3		South Fork (Beargrass and Northern Ditch)	
				3.3.5.3.1	Feasibility Screening	
				3.3.5.3.2	Modeling	
				3.3.5.3.3	Ground Truthing	
				3.3.5.3.4	Cost Estimating	
				3.3.5.3.5	Benefit/Cost Analysis	
		3.3.6			Prospect	
			3.3.6.1		Feasibility Screening	
			3.3.6.2		Modeling	
			3.3.6.3		Ground Truthing	
			3.3.6.4		Cost Estimating	
			3.3.6.5		Benefit/Cost Analysis	
		3.3.7			Small WTP's	
			3.3.7.1		Feasibility Screening	
			3.3.7.2		Modeling	
			3.3.7.3		Ground Truthing	
			3.3.7.4		Cost Estimating	
			3.3.7.5		Benefit/Cost Analysis	
		3.3.8			West County	
			3.3.8.1		Feasibility Screening	
			3.3.8.2		Modeling	

Chapter	Section	Sub-section 1	Sub-section 2	Sub-section 3	Sanitary Sewer Discharge Plan Heading	Description
			3.3.8.3		Ground Truthing	
			3.3.8.4		Cost Estimating	
			3.3.8.5		Benefit/Cost Analysis	
4					***Selection of Sanitary Sewer Discharge Plan***	
	4.1				**Public Participation and Agency Interaction**	Explain how the public involvment process at all levels was involved in the evaluation process
	4.2				**Final Selection and Development of Recommended Plan**	Documentation of final CIP
		4.2.1			Knee of the Curve Evaluation (design event vs. cost)	
		4.2.2			Programatic Values and Other Non-Monetary Factors	
			4.2.2.1		Environmental Issues/Impacts	
			4.2.2.2		Technical Issues	
			4.2.2.3		Implementation Issues	
		4.2.2			Prioritization of Projects	
		4.2.3			Implementation Schedule to Achieve Consent Decree Requirements	

How you can help clean up our waterway

- **Minimize your use** of fertilizers, herbicides, and pesticides. The less you apply and spray on your lawn, the less you will swim, wade, or play in. Use native plants in your gardens and landscape, which require less water and fertilizer.
- **Disconnect downspouts** from the sewer to divert water runoff onto your lawn and gardens, or connect them to a rain barrel to store the water for later use, which helps slow down stormwater runoff and reduce flooding.
- **Wash your car on your lawn or at a car wash** – they treat and recycle the dirty water to keep the soap, scum, and oily grit from entering our waterways.
- **Be an environmentally conscious** consumer – buy eco-sensitive products whenever possible available at most grocery markets. Vinegar and baking soda also clean very well and are non-toxic.
- **Pick up and properly dispose** of pet waste in trash containers – leaving it on the lawn allows harmful bacteria to run into storm drains or straight to our streams and the Ohio River during heavy rains.

For more tips and information:
www.msdlouky.org

Come out and help plant native shrubs and trees with Living Lands and Waters November 17th.

Visit us at www.msdlouky.org or call (502) 587-0603 to learn more about our rain barrel program, rain gardens and outreach events.

MSD

Louisville and Jefferson County
Metropolitan Sewer District

700 West Liberty
Louisville, KY 40203-1911

www.msdlouky.org

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PROJECT WIN
Waterway Improvements Now

Be a part of a WINning team and help keep our waterways clean.

Dear Louisville Metro Residents:

At MSD, we are committed to improving our waterways and streams, and realize that clean water is essential for our community's well-being and growth. Our vision of providing clean, safe waterways to be used by the community for recreational purposes and a home for thriving fish and wildlife is clearer than ever. MSD's intent is to provide you with an understanding of these complex water lity issues through regular updates, public meetings, and commun outreacn events. We believe that strong partnerships and public participation are needed and are key to the success of this vision.

As part of our commitment to you, we are continuing with our 17-year comp nsive sewer improvement program, Project **WIN** (Waterway Improvements Now). The program is designed to significantly reduce major sources of water pollution by reducing the overloading of sewers from excessive rainwater, thereby mitigating combined and sanitary sewer overflows throughout Louisville Metro.

As a resident living, working, or playing near our waterways, you also value and understand the importance of clean water to our community. During rainstorms, your neighborhood is particularly susceptible to sewer overflows. As such, we are providing you with some important information and tips to help aid you in minimizing the potential risks of contact with these waterways.

We look forward to working with you in our continuing efforts to improve the quality of our waterways. Together we can protect and enhance Louisville Metro's waterways to ensure they are clean, safe, and enjoyable for generations to come. Please call us at (502) 587-0603, or visit us online at **www.msdlouky.org/projectwin** to learn more about Project **WIN**, how you can get involved through upcoming events, and become part of the **WIN**ning team!

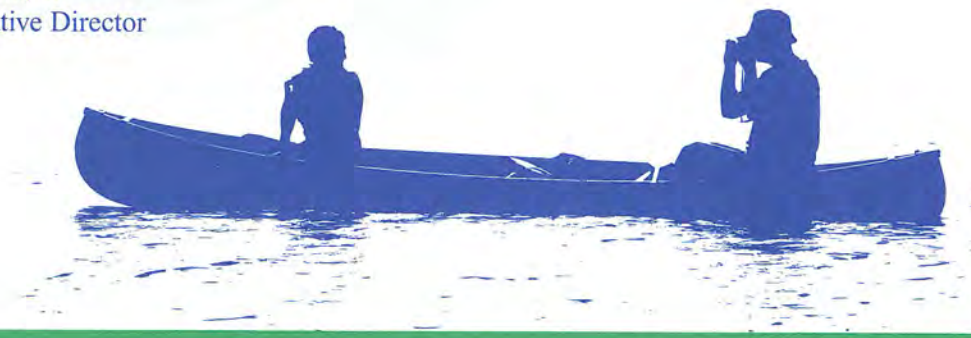
Sincerely,

H.J. Schardein, Jr.
MSD Executive Director

visit **www.msdlouky.org/projectwin** to learn how to be a part of a **WIN**ning team.

During, and for 48 hours after rain storms have ended, you should:

- **Minimize contact with waterways**
- **Avoid swimming, fishing, or playing in waterways**
- **Keep children and pets out of ponds, creeks, streams, and drainage ditches**
- **Wash your hands thoroughly after coming into contact with local streams and waterways**
- **Observe all MSD warning signs**



Clean, Green, Growing Community

PROJECT WIN

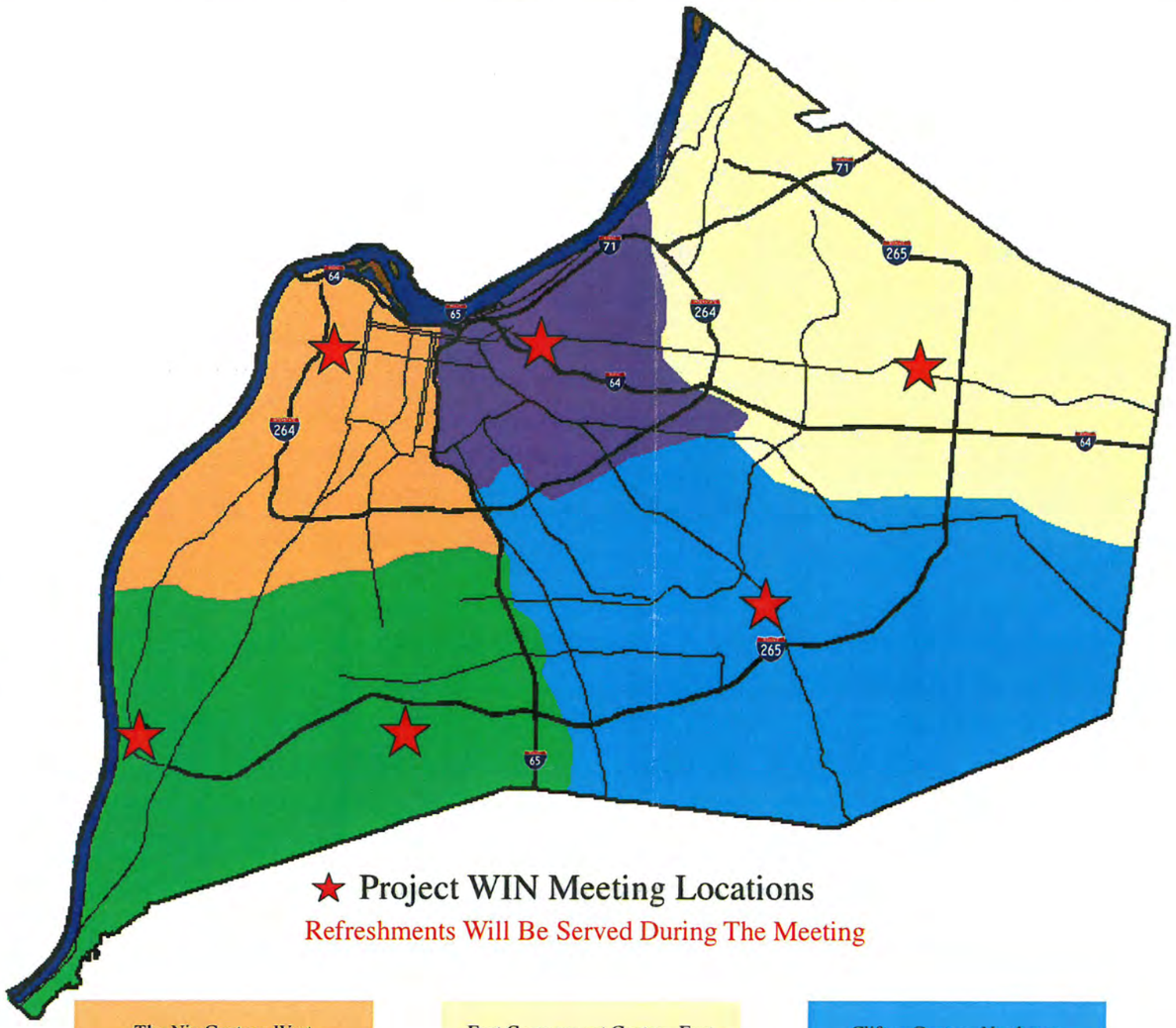
Waterway Improvements Now

MSD Will Be In Your Neighborhood

The public is invited to attend the second in a series of Project WIN input meetings. Project WIN will address problems with combined and sanitary sewer overflows. The purpose of these meetings is to get early feedback from residents on specific problems and potential opportunities for projects in their areas.

Doors open at 6:00 pm with a presentation to follow that provides an overview of MSDs Consent Decree and rate increase, Combined Sewer Overflow (CSO) and Sanitary Sewer Overflow (SSO) problems, and potential solution alternatives to reduce or eliminate their impacts. Staff will then be available for the remainder of the meeting to talk one-on-one with residents about sewer overflow problems and potential solutions planned for their neighborhood.

Public input is highly valuable as part of the planning process. Please forward this information to interested parties in your neighborhood, association, group or address book. Be a part of a WINning team and help keep our waterways clean.



★ Project WIN Meeting Locations

Refreshments Will Be Served During The Meeting

The Nia Center - West
2900 W. Broadway
Oct. 29, 6pm - 8pm

Fern Creek Fire House - Central
6200 Bardstown Rd.
Oct. 30, 6pm - 8pm

East Government Center - East
200 Juneau Drive
Nov. 12, 6pm - 8pm

Fairdale Playtorium Center - Southwest
10616 Manslick Road.
Nov. 13, 6pm - 8pm

Clifton Center - Northwest
2117 Payne Street
Nov. 27, 6pm - 8pm

Sun Valley Community - Southwest
6505 Bethany Lane
Nov 20, 6pm - 8pm

MSD

Louisville and Jefferson County
Metropolitan Sewer District

Portland	Jeffersontown
Shawnee	Fern Creek
Chickasaw	Okolona
South Louisville	Highview
Old Louisville	Prestonia
Downtown	Hikes Point
Beechmont	Buechel
Valley Station	St. Mathews
Fairdale	Lyndon
Iroquois	Prospect
Pleasure Ridge Park	Bass Shirley
Shively	Middletown
Clifton	Eastview
Crescent Hill	Douglass Hills
Highlands	Plainview
Phoenix Hill	Hurstbourne
Irish Hill	Lake Forest
Butchertown	Beechwood Village
Germantown	
Buechel	

For More Information, Please Contact The MSD 24-Hour Customer Relations Department at 502-587-0603 or Online at www.msdlouky.org

PROJECT WIN
Waterway Improvements Now

MSD
Louisville and Jefferson County Metropolitan Sewer District

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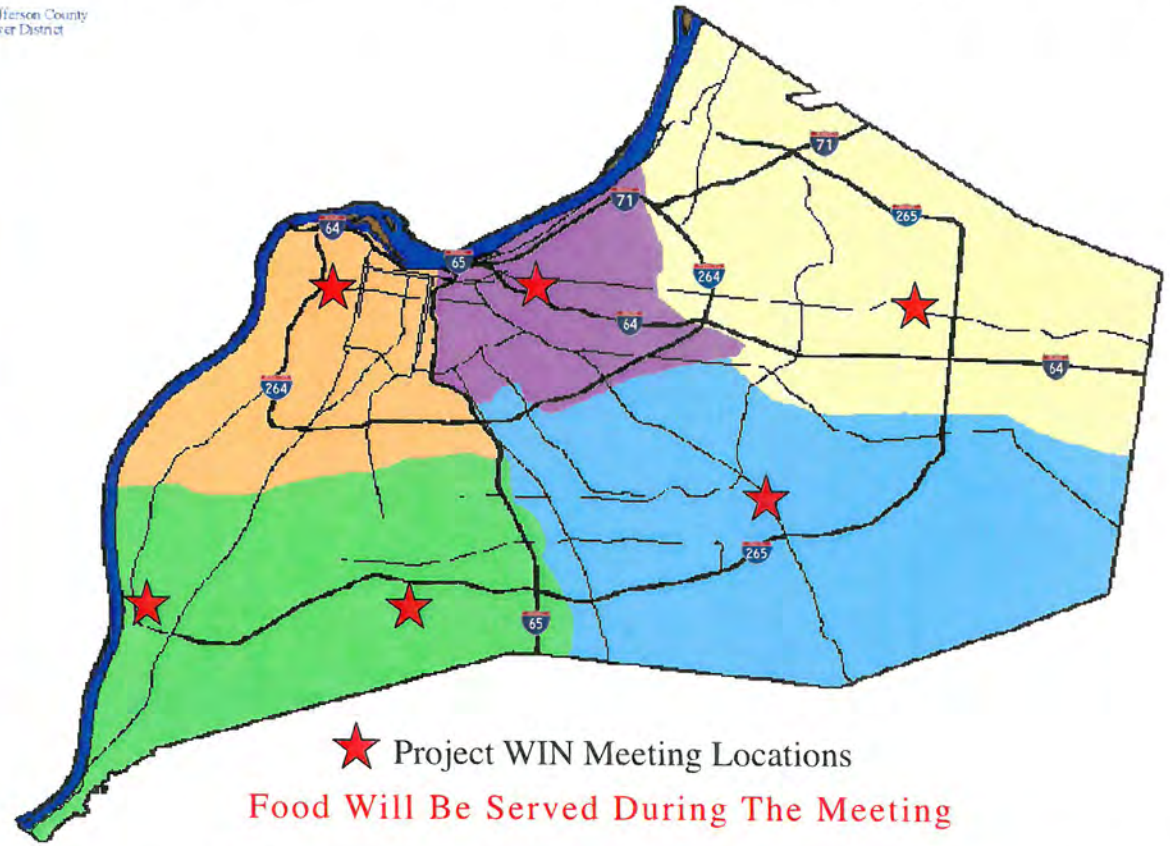

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For More Information, Please Contact The MSD 24-Hour Customer Relations Department at 502-587-0603 or Online at www.msdlouky.org

MSD
Louisville and Jefferson County
Metropolitan Sewer District

Be Part of a ning Team

Five Tips for the Holiday Season:

1. Keep Our Sewers Flowing Freely: Dispose of grease and oils after cooking by pouring into and a can to harden and scraping your fatty ingredients into the trash instead of down the drain.
2. Protect Our Streams and Rivers to Prevent Sewer Overflows: Use your dishwasher and washing machine only when they are full. Try to avoid use during heavy rain.
3. Protect Our Waterways: Dispose of your wrapping paper properly instead of burning in your fire place which puts toxics in the air and in our waterways.
4. Prevent Localized Flooding: keep storm drains clear of leaves, snow and debris
5. Protect Your Rain Barrel: Disconnect your rain barrel before the thermometer drops below freezing.

PROJECT WIN
Waterway Improvements Now

Holiday 2007

Definitions of Key Terms
Wet Weather Team Project, October 2007

Avoidable	A legal term of art meaning that a consequence could have been prevented with the exercise of reasonable engineering judgment in facilities planning and implementation, and/or adequate management, operations, and maintenance practices.*
Biochemical Oxygen Demand (BOD)	A measurement of the amount of oxygen used by the decomposition of organic material over a specified time period (usually 5 days) in a wastewater sample. Used as a measurement of the readily decomposable organic content of water.†
Best Available Technology Economically Achievable (BAT)	A technology-based standard established by the Clean Water Act as the most appropriate means available on a national basis for controlling the direct discharge of toxic and non-conventional pollutants to navigable waters. BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.*
Best Conventional Pollutant Control Technology (BCT)	A technology-based standard for discharge from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, oil, and grease. The BCT is established in light of a two-part "cost reasonableness" test.*
Best Management Practices (BMPs)	Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practice to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.*
Combined Sewer Overflow (CSO)	A discharge of untreated wastewater from a combined sewer system at a point prior to the headworks of a publicly owned treatment works. CSOs generally occur during wet weather (rainfall or snowmelt). During periods of wet weather, these systems become overloaded, bypass the treatment works, and discharge directly to receiving waters.*
Combined Sewer System (CSS)	A wastewater collection system that conveys sanitary wastewater and stormwater through a single pipe to a publicly owned treatment works for treatment prior to discharge to surface waters.*
Dissolved Oxygen (DO)	A measurement of the amount of oxygen dissolved in water.
Fecal Coliform	Rod-shaped bacteria present in the feces of warm-blooded animals.†

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* Adapted from Water Environment Federation, *Guide to Managing Peak Wet Weather Flows in Municipal Wastewater Systems*, Draft – February 2006.

† Adapted from EPA, "National Pollutant Discharge Elimination System Glossary," http://cfpub.epa.gov/npdes/glossary.cfm?program_id=0.

Green Infrastructure	An adaptable term used to describe an array of products, technologies, and practices that use natural systems—or engineered systems that mimic natural processes—to enhance overall environmental quality and provide utility services. As a general principal, green infrastructure techniques use soils and vegetation to infiltrate, evapotranspirate, and/or recycle stormwater runoff. Examples of green infrastructure include green roofs, porous pavement, rain gardens, and vegetated swales.
Infiltration	Water other than wastewater that enters a wastewater system and building sewers from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include inflow.[‡]
Inflow	Water other than wastewater that enters a wastewater system and building sewer from sources such as stormwaters, surface runoff and drainage. Inflow does not include infiltration.[‡]
National Pollutant Discharge Elimination System (NPDES)	A national program under the Clean Water Act that regulates discharges of pollutants from point sources to waters of the United States. Discharges are illegal unless authorized by an NPDES permit.[*]
Pathogen	An organism capable of causing disease, including disease-causing bacteria, protozoa, and viruses.[†]
Peak Flow	The maximum flow that occurs over a specific length of time (e.g., daily, hourly, instantaneous).[‡]
Primary Treatment	The practice of removing some portion of the suspended solids and organic matter in wastewater through sedimentation. Common usage of this term also includes preliminary treatment to remove wastewater constituents that may cause maintenance or operational problems in the system (i.e., grit removal, screening for rags and debris, oil, and grease removal, etc.).[*]
Sanitary Sewer	A pipe or conduit (sewer) intended to carry wastewater or water-borne wastes from homes, businesses, and industries to the publicly owned treatment works.[*]
Sanitary Sewer Overflow (SSO)	Untreated or partially treated sewage overflow from a sanitary sewer collection system.[*]
Secondary Treatment	Technology-based requirements for direct discharging from municipal sewage treatment facilities. The standard is based on a combination of physical and biological processes typical for the treatment of pollutants in municipal sewage. Standards are expressed as a minimum level of effluent quality in terms of: 5-day BOD, suspended solids, and pH.[*]
Sensitive Areas	Areas of particular environmental significance or sensitivity that could be adversely affected by a combined sewer overflow.[‡]
Total Suspended Solids (TSS)	A measure of the filterable solids present in a sample.[*]

[‡] Adapted from EPA, *Report to Congress on Implementation and Enforcement of the CSO Control Policy*, http://cfpub.epa.gov/npdes/cso/cpolicy_report.cfm?program_id=5.

The Role of Infiltration & Inflow Reduction in MSD's SSO Control Strategy

Wet Weather Team

Stakeholder Group Meeting No. 13

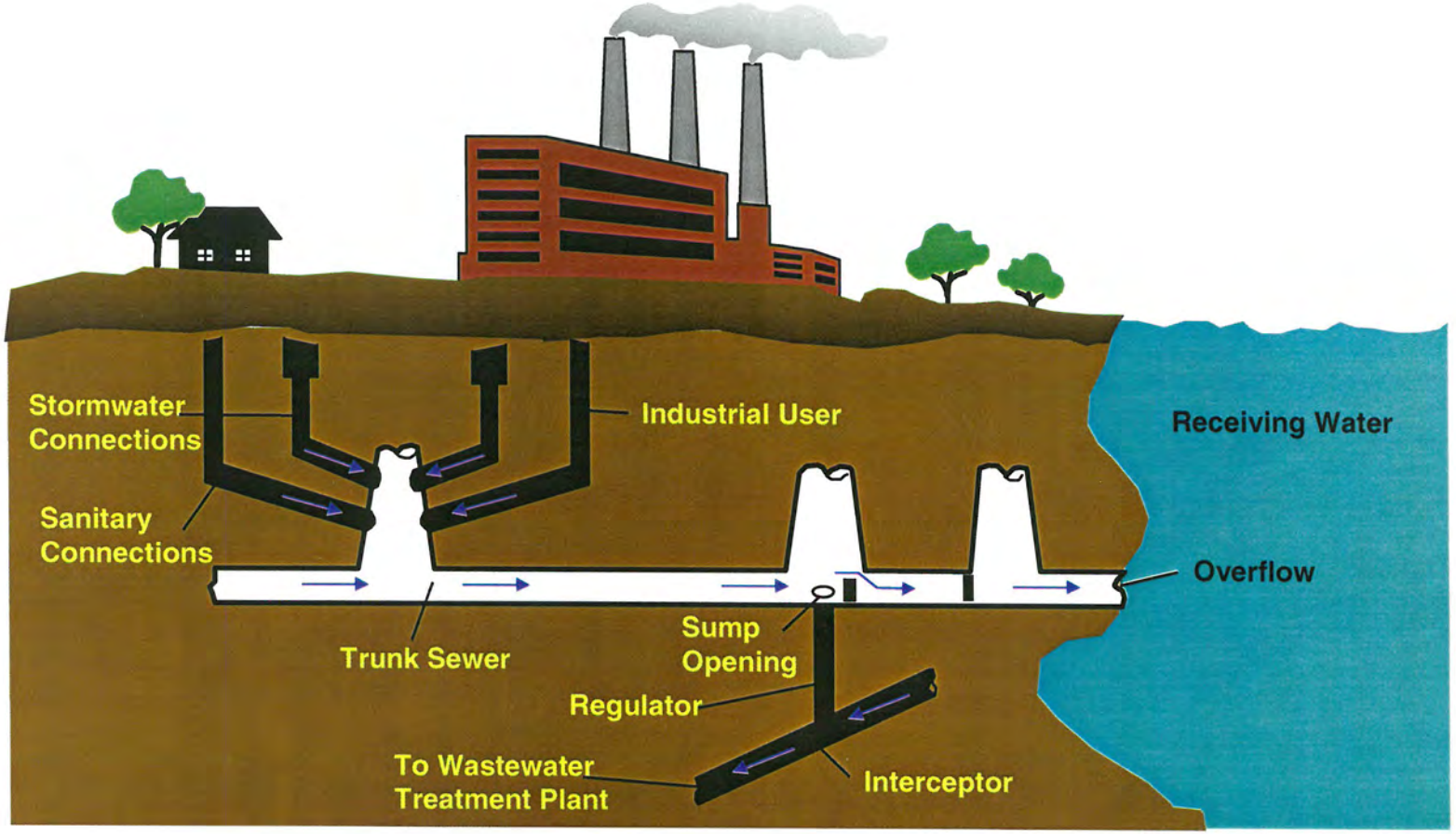
October 18, 2007

Louisville & Jefferson County
Metropolitan Sewer District

Agenda

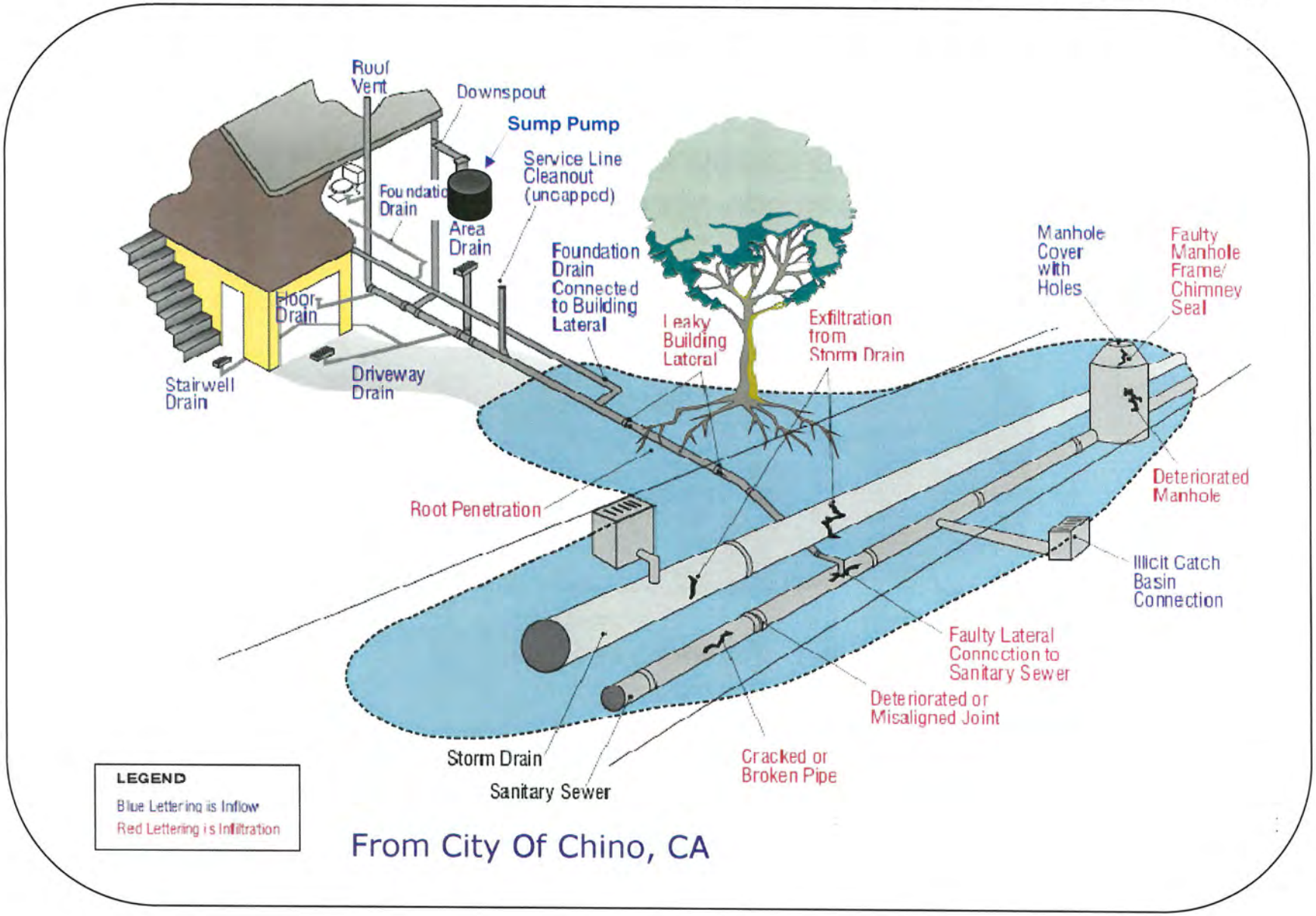
- Root causes of SSOs
- MSD's Infiltration & Inflow (I&I) reduction experiences
  - Publicly-owned facilities
  - Privately-owned facilities
- Other agency experiences in I&I reduction for SSO control
- Case Study - SSO control through I&I reduction – Milwaukee, Wisconsin
- Case Study - Illegal connection elimination – Johnson County, Kansas
- SSO control regulatory requirements
- Private-side I&I reduction approaches
- Discussion – MSD's Private-side I&I reduction program

Combined Sewer Systems Convey Sanitary Waste and Runoff to Treatment or Overflow



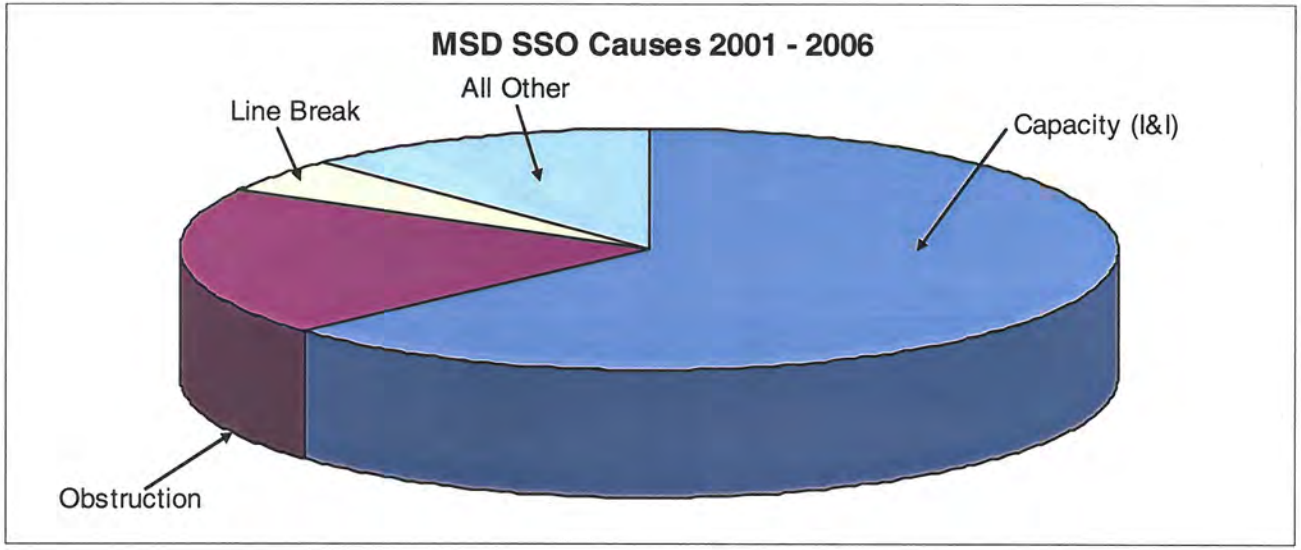
Separate Sanitary Sewers are Designed to Carry Sanitary Waste Only

Sewer Capacity Affected by Infiltration and Inflow



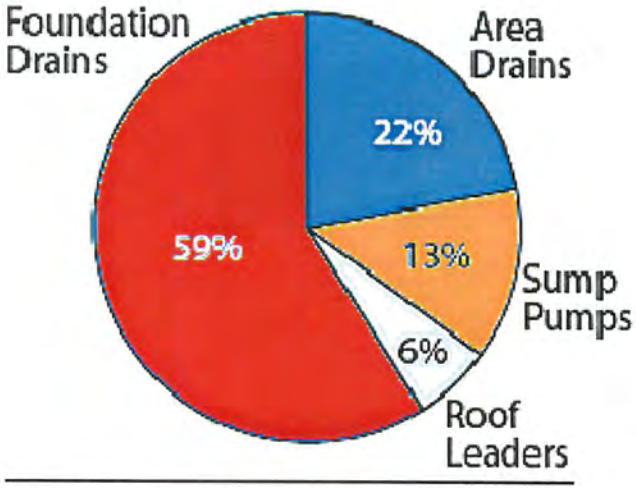
From City Of Chino, CA

Infiltration and Inflow (I&I) Contributes to 2/3 of MSD's Sewer Main SSOs



- Data do not include basement back-ups due to root and grease obstructions in property service connections

Private Property Sources Typically Contribute 50% or More of All System I&I

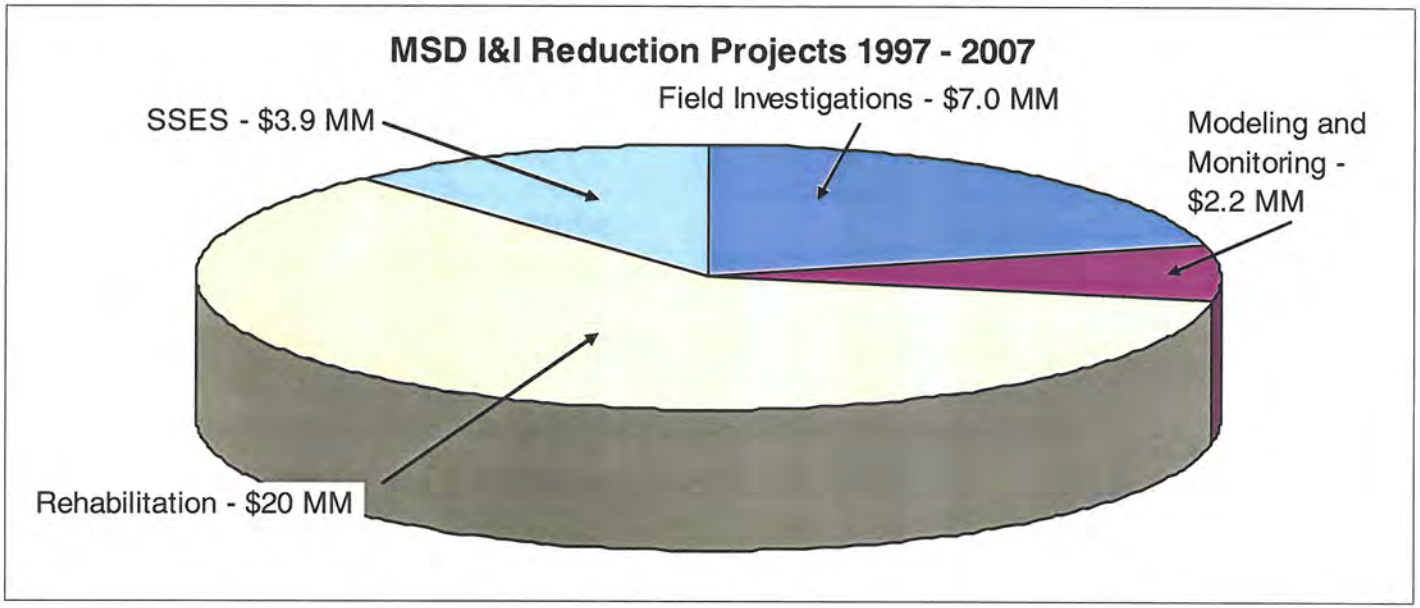


Sources of Private Property I&I
(From Johnson County KS study)

Roof leaders and exterior area drains are easy to locate and fix

Actual percentage for any location depends on extent of basement sewer service, groundwater levels, soil types, etc. Johnson County data do not include contribution from private-side laterals

MSD Has an Aggressive I&I Reduction Program for Public Side Facilities



Over 115 projects, costing over $33 Million

SSES – Sewer System Evaluation Survey

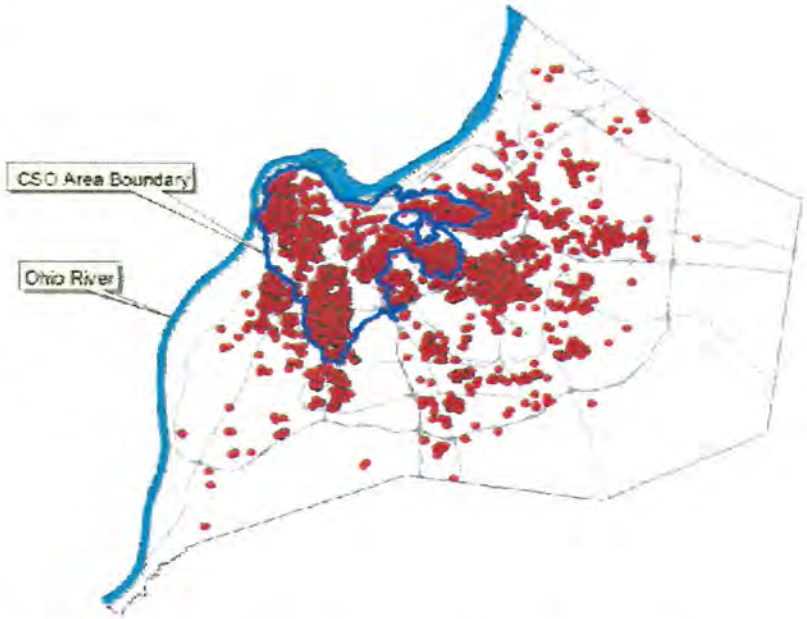
Public Side I&I Reduction Alone Has Not Solved the SSO Problem

Basin Location	Cost $MM	Immediate I&I Reduction %	Long-Term Outcome
Hikes Point	$2.4	39% - 55%	Pumped SSOs
Beechwood Village	$0.7	79% - 96%	Pumped SSOs
JTown	$4.5	19% - 88%	Frequent SSOs
Woodland Hills	$1.7	18% - 123% increase	Continued SSOs

Post construction flow monitoring showed significant benefits, but long-term observations indicate that some benefits were not sustainable.

MSD's Current Private-Side I&I Reduction Approach is Voluntary Plumbing Modification Program (PMP)

- PMP targets basement back ups, but also requires disconnecting illegal connections if found
- 6,700 projects completed (each project may include multiple source disconnects)
- Average cost per house is $1,641
- $11 Million spent to date
- Proven success at basemen. back-up reduction
- Projects too scattered to monitor I&I reduction
- Addresses illegal connections, but not service laterals



Location of completed Plumbing Modification Program projects

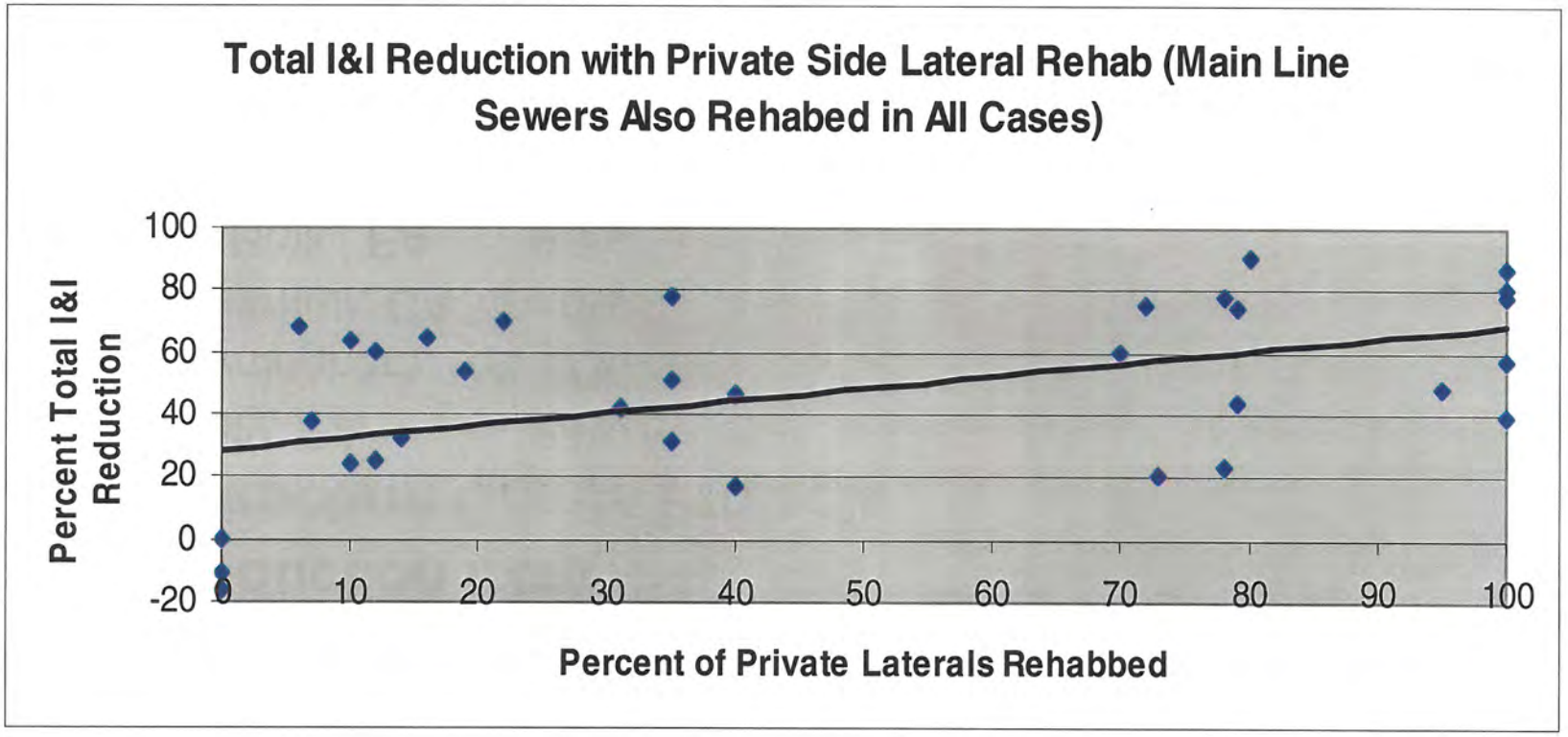
EPA Studies Show that Private-Side I&I Control Is Important For Overall I&I Reduction Effectiveness

- **Conklin Report – 1980**
  I&I Reduction from
  Construction Grants Projects
  - Amity, PA 24%
  - Coyningham, PA 17%
  - Dunsmuir, CA 0%
  - Mt. Holly, PA 23%
  - New Buffalo, MI 1%
  - Shelton, WA -6%
  - Sussex, WI 7%
  - Castle Rock, WA 60%

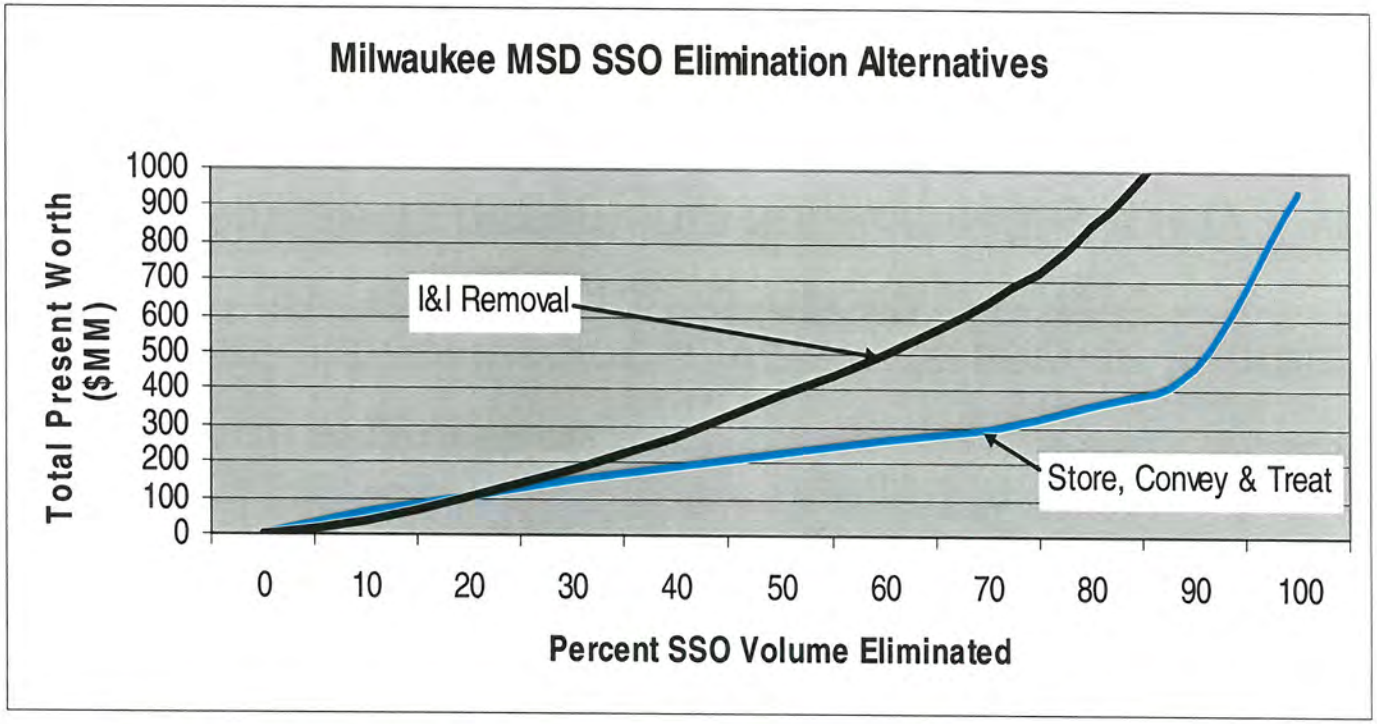
Aside from Castle Rock, the average I&I reduction was 9%

Castle Rock was the only community to *repair private laterals*. They didn't know that it was against EPA Construction Grant Regulations.

Data Supporting Private Lateral Rehab Effectiveness are Scattered



Case Study - Milwaukee MSD Advanced Facilities Plan Evaluated "I&I Removal Only" Alternative

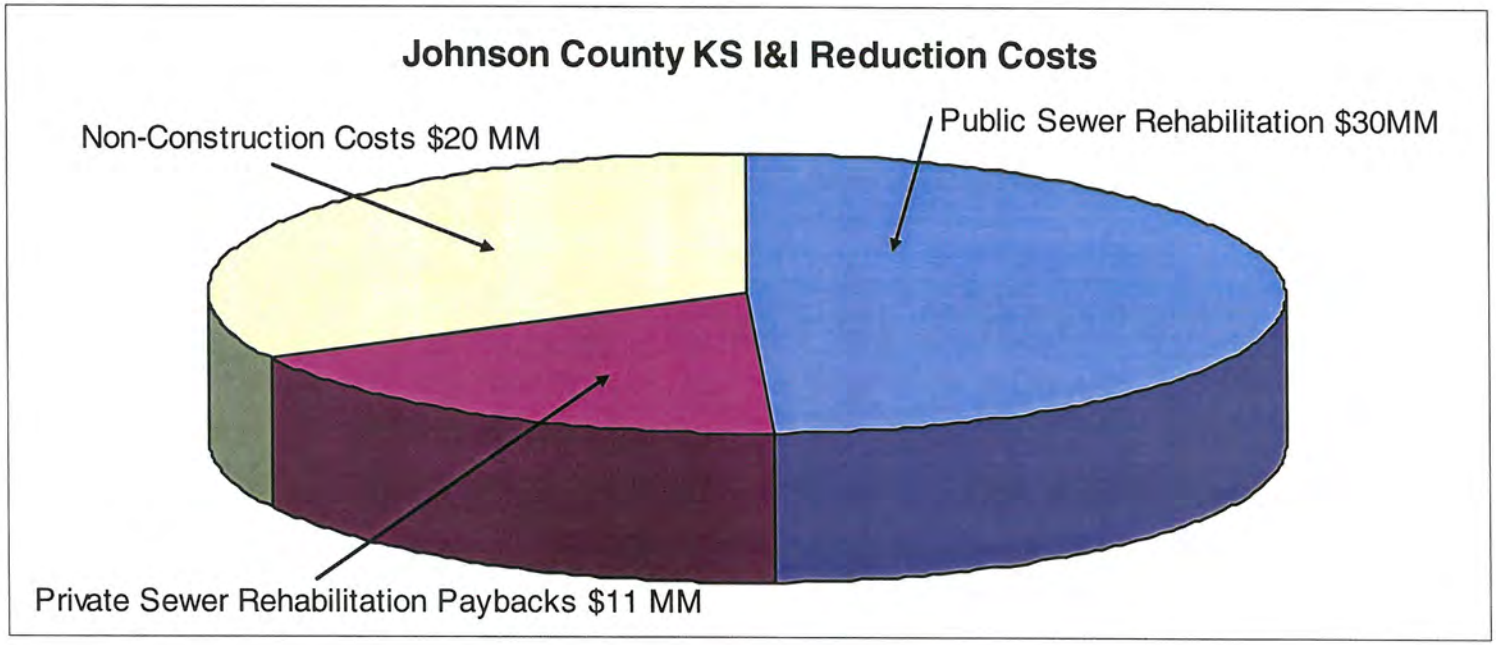


I&I Removal least cost approach up to 20% SSO volume elimination, constructed facilities less costly to achieve higher levels of control

Case Study - Johnson County, Kansas, Represents "Gold Standard" for Private-Side I&I Control

- County commissioners passed ordinance in 1985 requiring disconnection of clear water discharges to sewers
- Voluntary disconnect program was used to initiate program
- Policies to enforcement equity resulted in 100% participation in program
- Inspections did not include private-side service laterals; basement and exterior ground inspection only
- County reinspects basements approximately every 7 years
- Property owner required to disconnect illegal connections
- County reimburses for disconnect, up to established schedule of values
- County also has comprehensive sewer main rehabilitation program and backup prevention program

Johnson County, KS Spent $61 Million On I&I Reduction 1985 - 2005



Non-construction costs include home inspections, engineering evaluations, system designs, and contract administration.

Johnson County Program Illustrates Both Performance and Limitations of Private-Side I&I Control Approach

- Modeled SSO volumes greatly reduced
  - Private-side reduction is 40% of the total reduction
- Observed SSO incidents greatly reduced
- Observed and Modeled SSOs have NOT been eliminated, after 22 years of aggressive I&I reduction
- Current SSO elimination program includes
  - expansion of private property program to detect gravity foundation drains, private side lateral defects
  - relief sewers for added conveyance capacity
  - consideration of in-line and off-line storage
  - added treatment capacity for wet weather flows

Critical Success Factors To Achieve Regulatory Approval of SSO Elimination Program

- Timely Implementation
  - Complete source control difficult to do quickly
  - Constructed facilities easier to control schedule
- Certainty of Outcome
  - Source control uncertain, data scattered
  - Constructed facilities highly certain, and can be oversized for conservatism
- Effective Use of Resources
  - Source control low-hanging fruit very cost-effective, complete elimination prohibitively expensive
  - Constructed facilities cost effective for high levels of SSO control
- Sustainability
  - Source control requires continuous renewal
  - Constructed facilities require continuous O&M
- Implementability
  - Access to private property difficult without legal authority
  - Facilities siting requires overcoming "NIMBY" syndrome

MSD's SSO Control Program Will Consider a Balance of Approaches

- Continued I&I elimination from MSD assets, with ongoing monitoring to demonstrate progress
  - Major part of Capacity, Management, Operations and Management (CMOM) program
  - I&I reduction projects include sealing inundated manholes, lining or rebuilding sewers under creeks, etc.
- Increased activity in private-side I&I elimination
  - *"If we can't control private-side I&I, our Consent Decree response will not be successful"* Brian Bingham, at MSD's Regulatory Management Services division staff meeting Oct 8, 2007
  - Private side approach not determined yet
- Prioritized construction of facilities, with periodic review of progress in I&I reduction to see if planned facilities can be downsized or eliminated
  - storage
  - conveyance
  - treatment

MSD's Private-Side Approach Must Consider Three Key Issues

- Legal authority to enter property
  - MSD is special district without general-purpose government powers
  - Discontinuation of service is most drastic recourse available to MSD
- Who pays for improvements to private property?
  - Precedent established with Plumbing Modification Program to reimburse for repairs
  - Other programs without cost-share have failed
- Public education and involvement
  - Voluntary program requires informing and convincing majority of customers to participate
  - Involuntary program must also manage "political fallout"

Experiences of Other Agencies Can Help MSD Develop Its Private-Side Program

- Voluntary Program Expansion?
  - Expand current PMP focus beyond basement back-up prevention
  - Offer sewer lateral maintenance service
  - MSD offer to line private lateral as part of blockage removal (free, cost shared, or homeowner pays)
  - Others?
- Non-Voluntary Program Development?
  - Fund additional state plumbing inspectors for ongoing basement inspections
  - Metro Government enacts plumbing disconnect ordinance and takes responsibility for enforcement
  - Metro Government grants MSD authority to enforce ordinance
  - Metro Government adopts ordinance to inspect and repair as part of property transfers
  - Others?

Funding Options Affect "Fairness" and "Implementability" of Program

- Option - Property owner bears full responsibility for costs
- Option - MSD reimburses for full cost, up to max amounts
- Option - MSD/property owner cost share
- Option - Property owner pays, but MSD finances with reimbursement through sewer charges
- Option - MSD pays only during "grace period"
- Other considerations or options?

Discussion – MSD's Private Property I&I Reduction Program

- Format of program
- "Ownership" of program
- Triggers for inspection
- Funding and reimbursement approaches
- Other thoughts?

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Project WIN Funding Plan

Wet Weather Team

Stakeholder Group Meeting

October 18, 2007

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Purpose of this Presentation

- Define what the consent decree's charge related to a funding plan means in practice
- Review updated information regarding MSD's financial condition and current funding sources
- Discuss key needs and interests related to funding sources

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Consent Decree Requirements for the Wet Weather Team

"The team will prepare a plan for funding the program and will develop a program for public information, education, and involvement."

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EPA's Long Term Control Plan (LTCP) Guidance on Funding

Indicates that the method of financing can be selected or modified based on public input.

Method of financing should be determined by:

- Availability of each option in the community
- Advantage and limitations of a specific type of financing

The LTCP should identify a specific capital and annual cost funding approach.

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EPA's Long Term Control Plan Funding Guidance (cont'd)

Potential funding sources include:

- ↗Bonds
- ↗Loans
- ↗Grants
- ↗Privatization
- ↗Other Capital Funding Sources (e.g., special reserves or "pay-as-you-go")

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Elements of a Funding Plan

- Appropriate Rate Structures
- Capital Budget (5-7 years)
- Operating and Maintenance Budget
- Identification of Funding Sources
- Debt Service Schedule
- Identify Existing Covenants (i.e. debt service coverage requirements)

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Key Areas for WWT Input

- ↗Refinement of Rate Structure
- ↗Prioritization of Capital Projects
- ↗Development of Additional User Fees
- ↗Funding Alternatives (e.g., Pay as You Go, Bond Issues)

Note: These items are inter-related.

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MSD CAPITAL BUDGET

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FY 2008 - 2012 Capital Budget: Major Uses of Funds (millions)

Wastewater Treatment/Infrastructure	$ 125.0
CSO, Wet Weather, & Water Quality	$ 99.3
Drainage/Flood Control	$ 50.6
LOJIC (Geographic Info System)	$ 2.0
Misc./General	$ 2.8
Capital Equipment	$ 14.8
TOTAL	$ 294.5

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MSD OPERATING BUDGET

FY 2008

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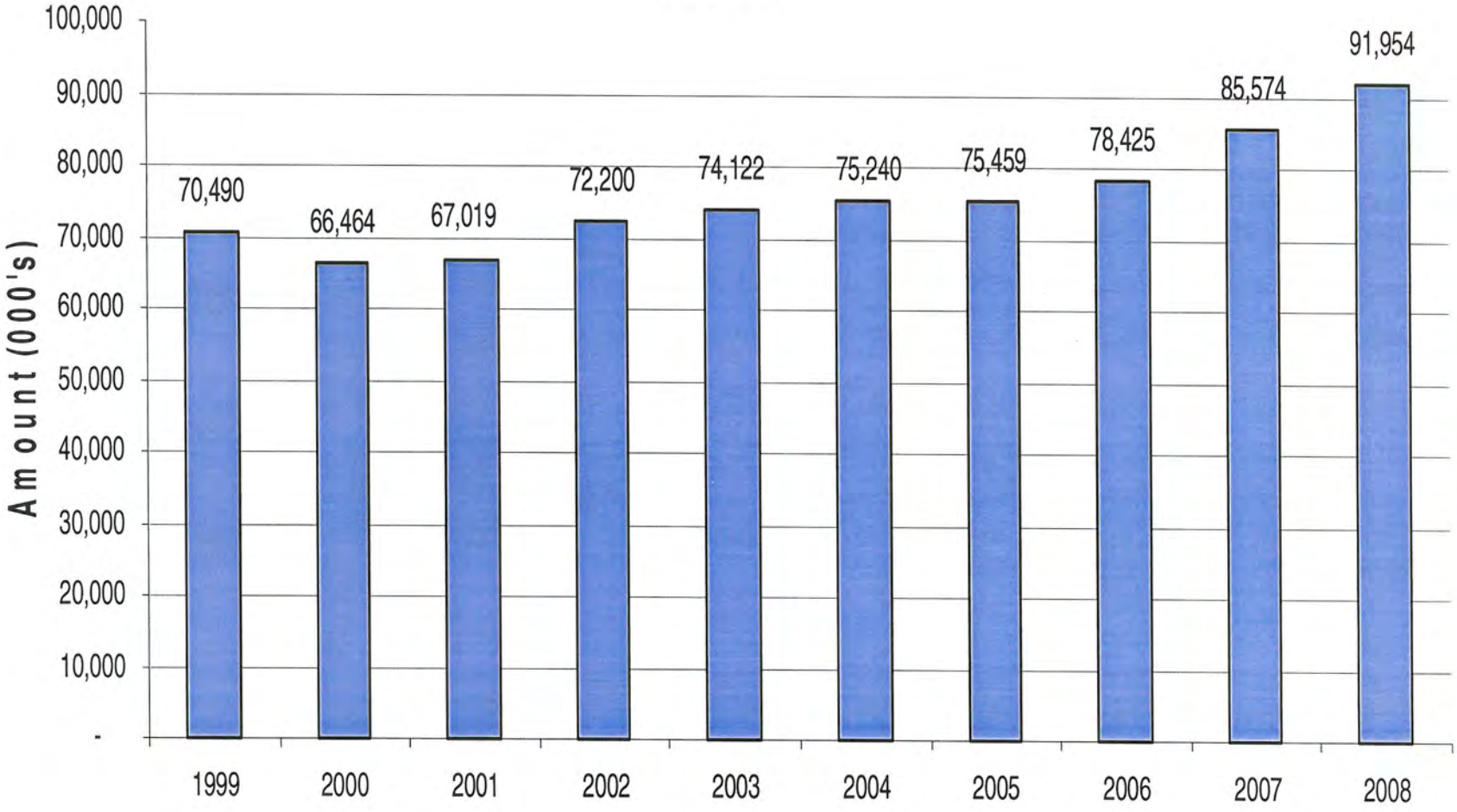
Metropolitan Sewer Distict
Operating Budget Requests
1999 - 2008



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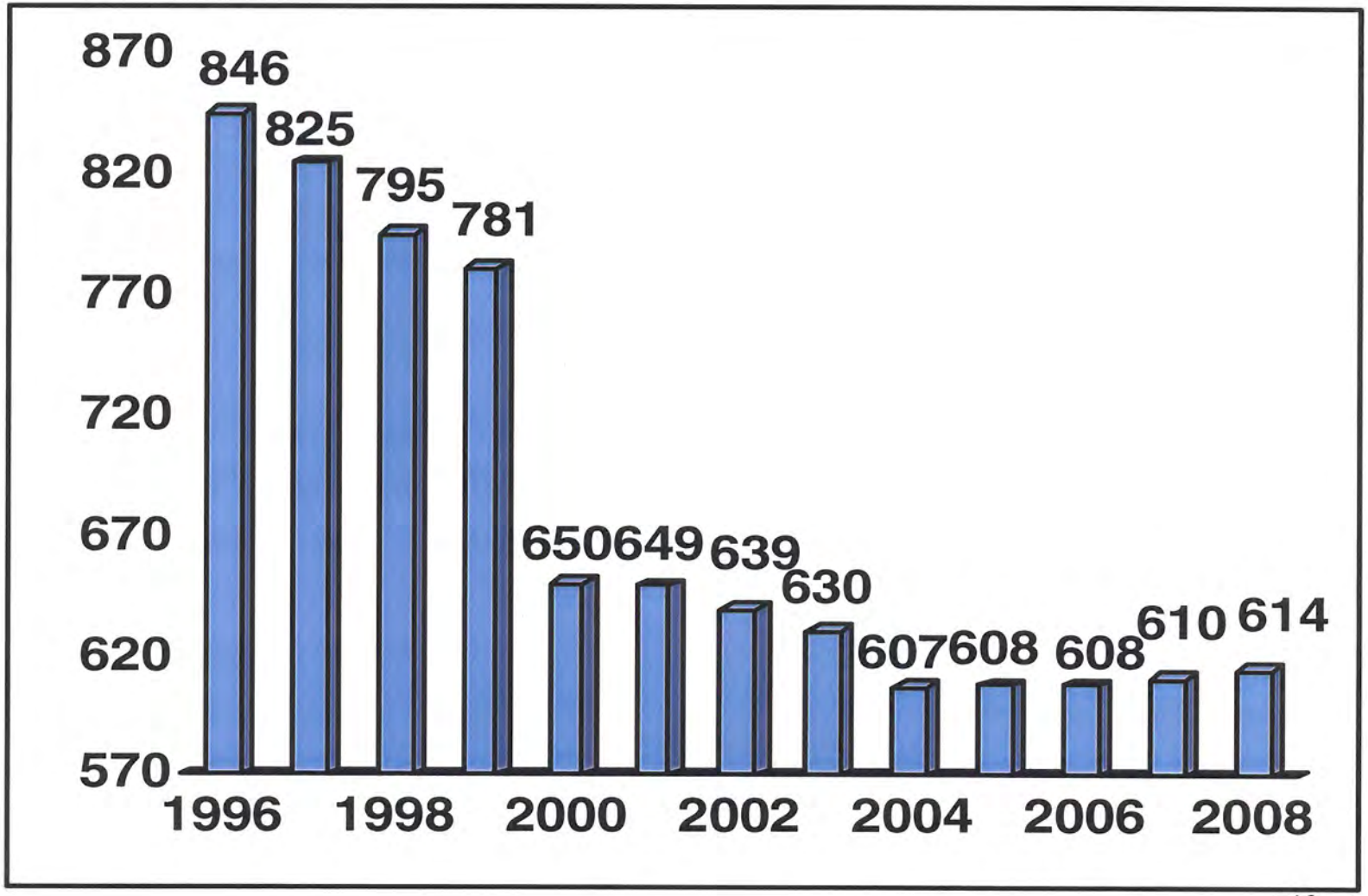
Full-Time Equivalent Staff



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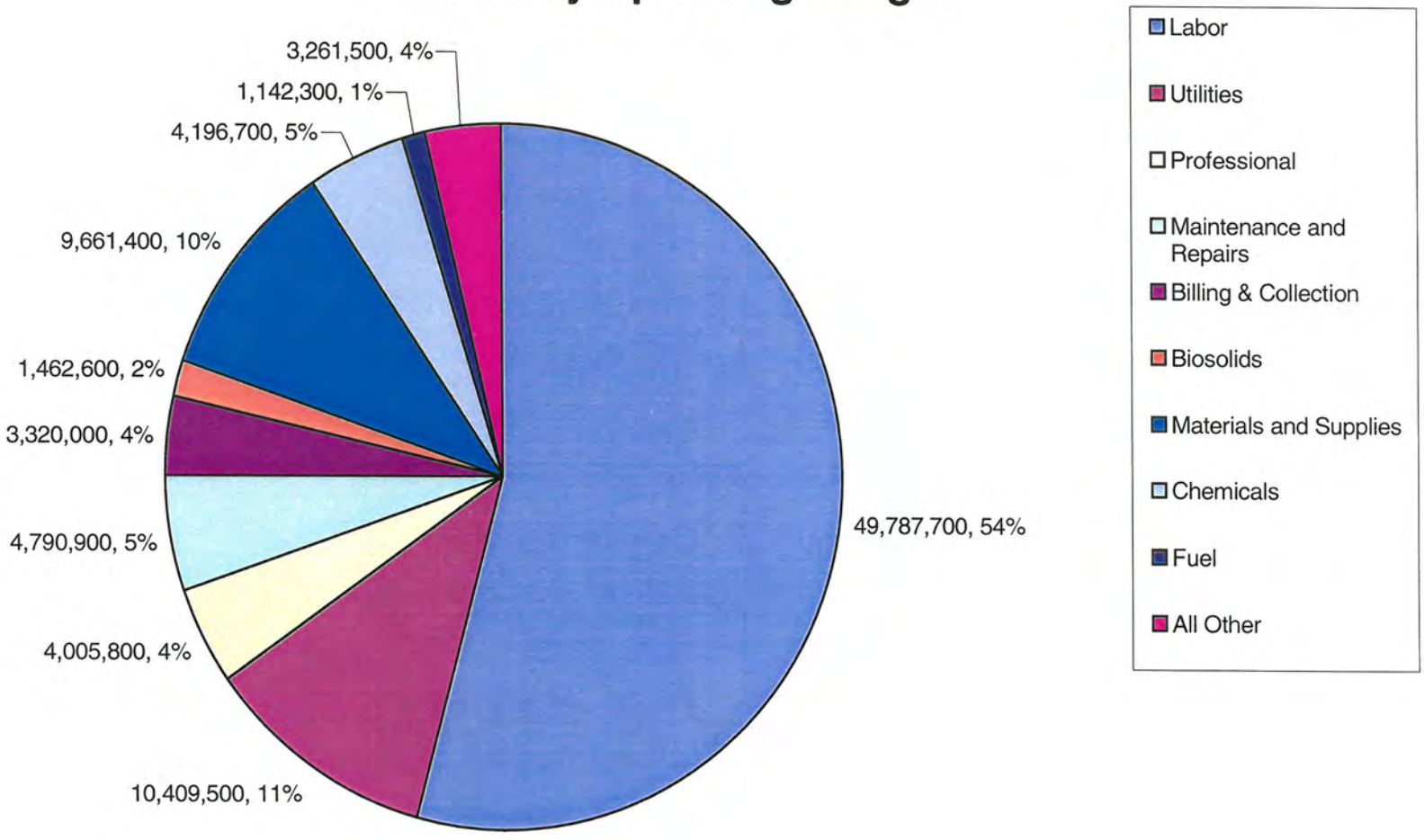
FY 2008
Preliminary Operating Budget



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MSD RATES

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Impact of 2007 Rate Increase

- Addition of EPA Consent Decree Surcharge added $6.95 per month to residential bills.
- Average monthly residential wastewater bill increased by $6.95 from $21.19 to $28.14.
- Senior citizens discount of 30% off wastewater and EPA Consent Decree Surcharge was approved.
- EPA Consent Decree Surcharge expected to generate $35 million annually.

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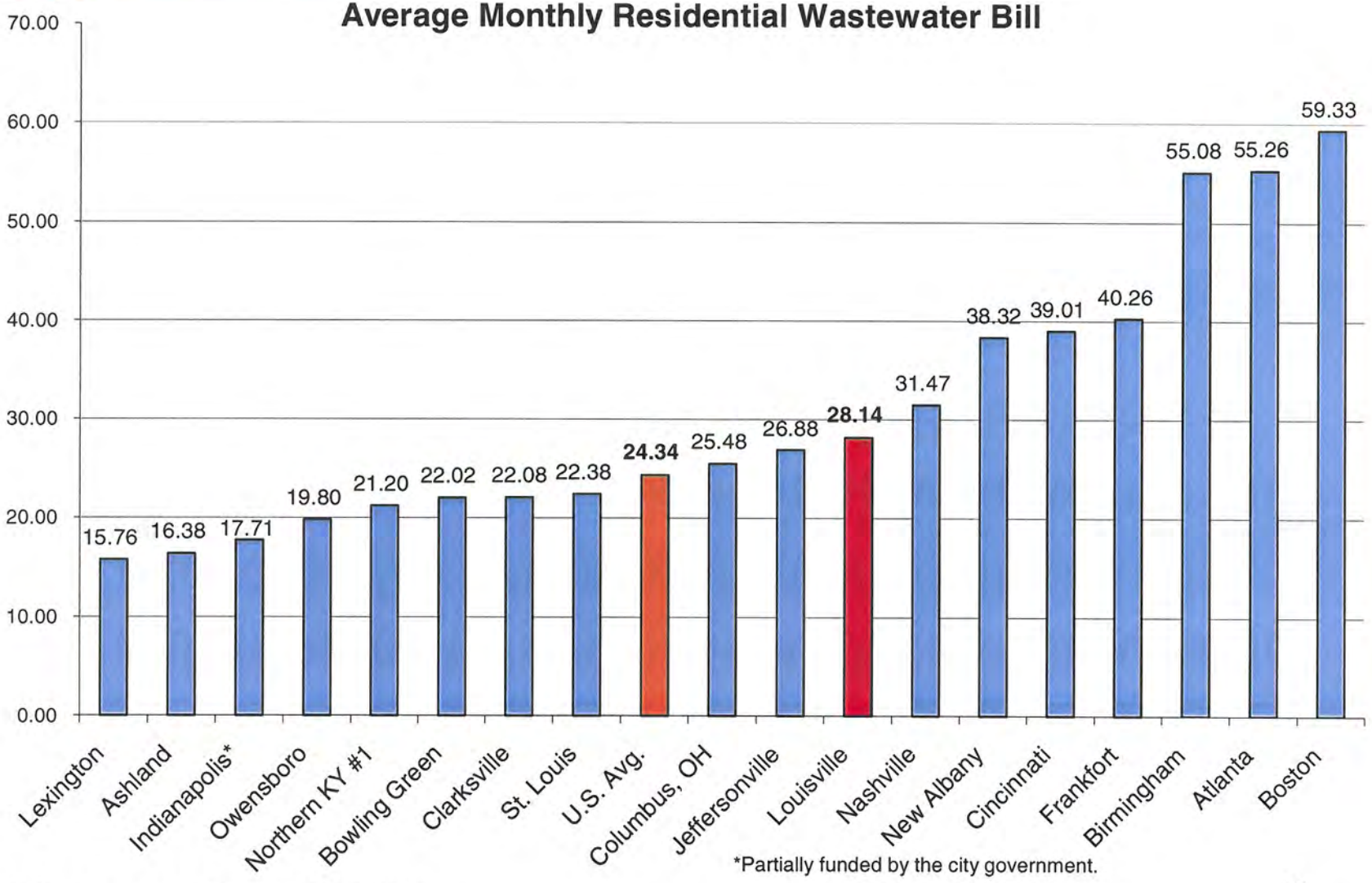
Average Monthly Residential Wastewater Bill



*Partially funded by the city government.

Rates are as of August 15, 2007

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FY 2007 REVENUES

Wastewater	$96,594,000
Drainage	$29,896,000
Other	$ 5,956,000
Total	$132,446,000

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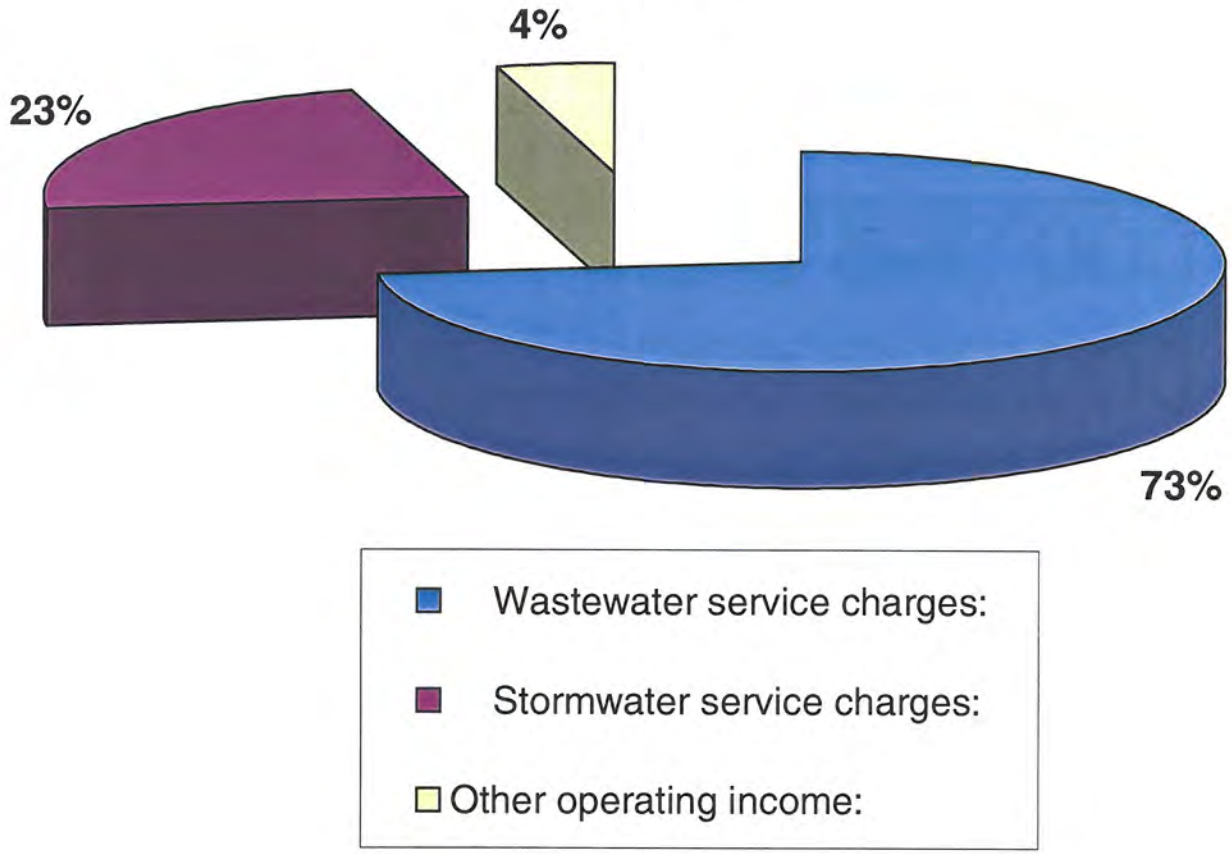
Metropolitan Sewer District
Fiscal Year 2007
Revenues



Note – MSD is self-supporting through service charges and other user fees. MSD does not receive financial support from Metro Government or the State.

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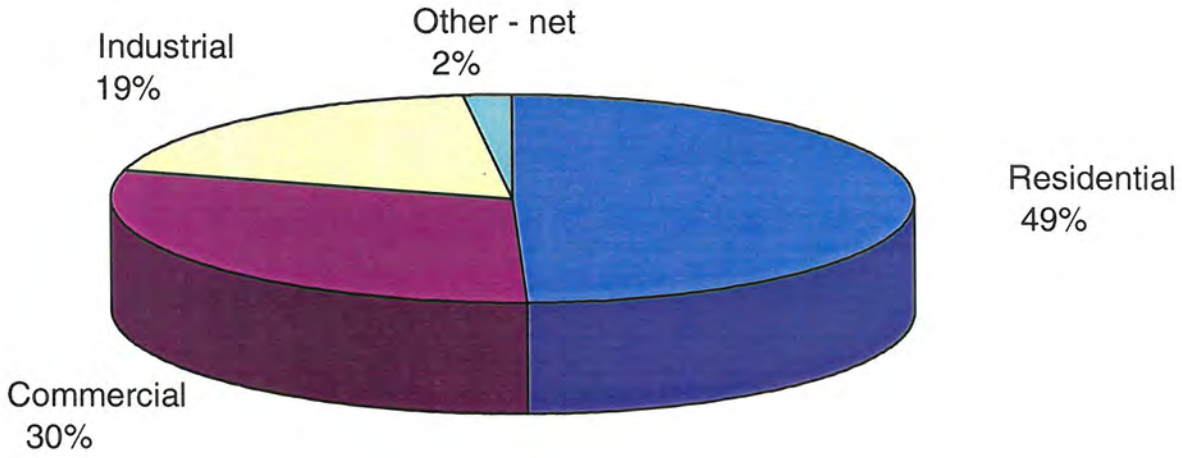
Wastewater Service Charges
FY 2007



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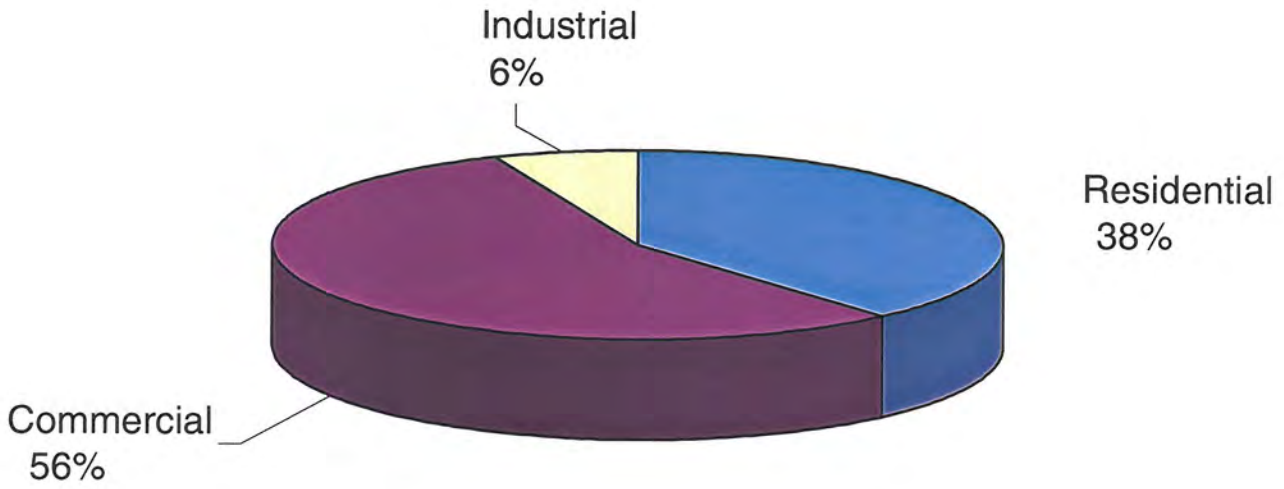
Stormwater Service Charges
FY 2007



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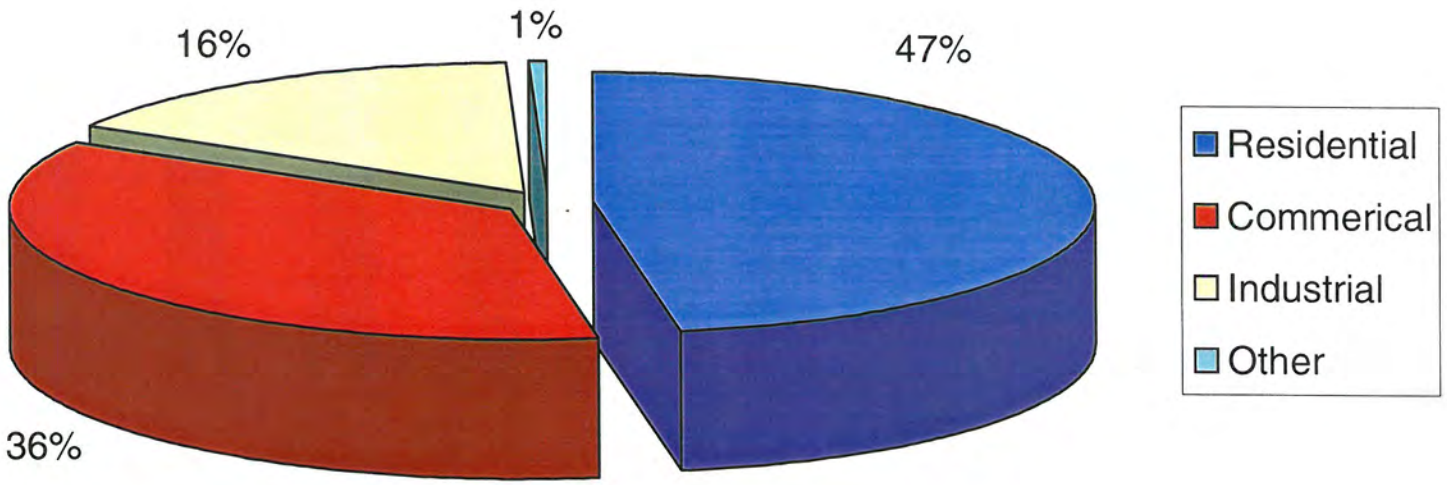
Overall Service Charge Revenues
FY 2007



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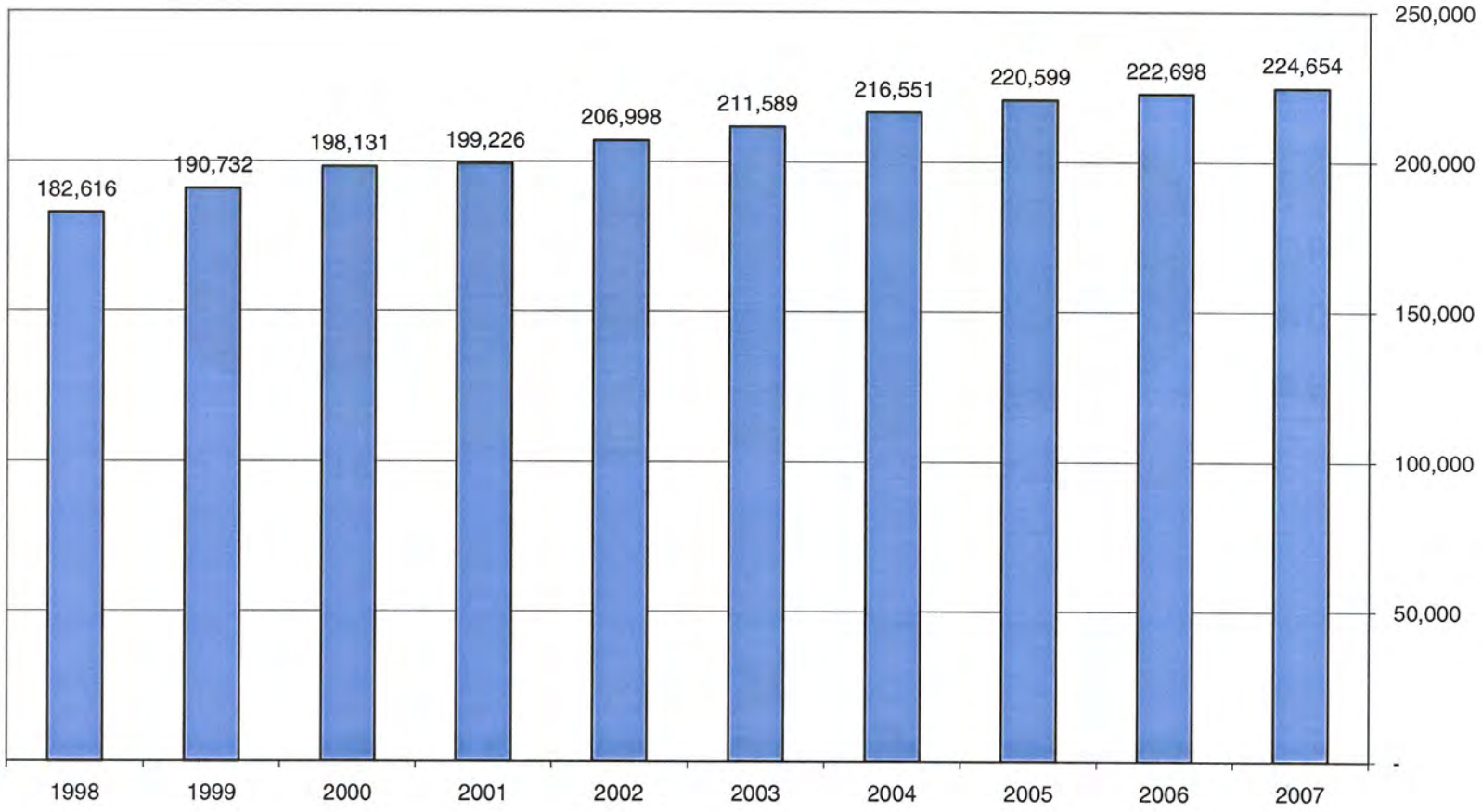
MSD CUSTOMER GROWTH



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MSD FINANCIAL CONDITION

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Financial Factoids

- Since 1997, MSD has issued $1.3 billion in tax-exempt bonds to finance its capital program.
- Principal and Interest payments related to these bonds are approximately $89 million annually.

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Current Funding Sources

- MSD revenues – $132.5 million for FY 2007
- Municipal Bond Market – currently $1.3 billion of MSD bonds outstanding
- Grants – typically less than $2 million annually
- Capital Contributions – primarily sewer lines and pump stations – average of $10.9 million over past 8 years

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Potential Funding Sources

- Kentucky Infrastructure Authority (Clean Water Revolving Fund)
- Kentucky Association of Counties
- Federal Grants above current levels
- Municipal Bond Market
- Internally Generated Funds (various MSD revenue streams)

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Kentucky Infrastructure Authority

Advantages

- Low interest rates
- Debt is subordinated which helps with debt coverage ratios

Disadvantages

- Projects must be placed on KIA priority lists
- Shorter repayment period than municipal bond issues
- KIA must approve some elements of the project

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Kentucky Association of Counties

Advantages

- Simple process for obtaining funds
- Debt is subordinated which helps with debt coverage ratios

Disadvantages

- Shorter repayment period than municipal bond issues
- Overall cost of funds may be higher than MSD could obtain on its own

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Federal Grants

Advantages

- Funds typically don't have to be repaid

Disadvantages

- May require matching of funds
- May require special audits
- Not a consistent funding source – no guarantee of availability on a yearly basis

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Municipal Bond Market

Advantages

- Repayment can be spread out over 30 to 40 years
- Current interest rate environment is relatively low
- MSD credit is a known commodity in the market place

Disadvantages

- Requires rate increases to pay off the debt
- Must adhere to covenants made with bond holders
- Interest rates can quickly change depending on market conditions thus increasing debt service payments

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Internally Generated Funds

Advantages

- Don't require interest payments
- Little, if any, restrictions on how the funds can be spent
- Reduces future borrowings thus lowering future debt service cost

Disadvantages

- Requires rate increases to generate the funds

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Discussion Questions

- Do you have any questions about the WWT's charge to prepare a funding plan, or any refinements to suggest to that charge?
- Do you have any questions about MSD's current financial conditions and funding sources?
- What key needs and interests do you have related to funding sources for the Wet Weather Program?
- What, if any, additional information would be helpful for future discussions on funding sources?

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Additional Questions